The New York State

Conservationist

State of New York Conservation Department

June-July 1957

Last chance?

Even as some of our human aches and pains are ofttimes symptomatic of maladjustment in our physical organization, so the problem of posted lands is symptomatic of maladjustment in our social organization.

Nor is this stress of public hunting pressure vs landowner rights an ailment of recent origin. The seeds of maladjustment were sown in the soil of our free world when, as an adjunct to securing our freedom from the old order, title to our wildlife resources was vested in all the people. Thus, while any man may own property, his title does not extend to the fish and game that may at any given time find a home upon his lands. However, with title to land, it's the owner's prerogative to decide who shall trespass upon his property to harvest the fish and game crop belonging to all of us.

This neat paradox didn't bother anyone in the early days. The land was vast, fish and game were abundant and "sportsmen" who hunted and fished simply for the fun of it were "rare birds." Not only were they few in number but buckboards and primitive roads were effective deterrents to all but the most hardy.

So, though the seeds of maladjustment were growing, our social order, like any vigorous young body, was resilient. The stress was hardly noticed—until we became millions in place of thousands; developed automobiles in place of buckboards; built networks of high-speed highways in place of rutted wagon roads; created an economy that permitted more and more free time—in short, changed our whole way of life. And changed too, the environment for the seeds of maladjustment. Now they flourished and the paradox began to pinch; at last became the ogre that confronts us today; that threatens to deprive us of our rights to enjoy common ownership of our wildlife resources.

We in New York are not alone in the struggle to preserve these rights. All the more populous states in the country have the same problem and ultimately every state will be forced to meet the issue. We have met it this year with the passage of The Wildlife Management Practices Act. A companion piece to the successful Forest Practices Act, this new legislation is, we believe, the most comprehensive, fundamental and realistic approach yet made in this country to the landowner-sportsmen problem. It re-establishes equities and provides a framework within which the sportsmen, the landowner and the Conservation Department may work together to beat this social maladjustment. And, the incentive is strong—*This could be our last chance!*—Editor

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JUNE-JULY, 1957

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The Fish and Game Dollar

Where It Comes From—Where It Goes

EVERY sportsman is interested in how the fish and game dollar is spent. He is entitled to know. Before it is spent, however, it must be received. A complete picture, therefore, can be obtained only from considering both income and expenditures.

The State Finance Law, many years ago, set up the "Conservation Fund." Into this fund *must* go *all* moneys received from the sale of hunting, fishing and trapping licenses, all the moneys received from fines and penalties for settlement of violations of the Fish and Game Law, and *all* other income arising out of the operations of the Division of Fish and Game. The moneys can be spent *only* for fish and game activities.

The only other source of income for fish and game activities is Federal Aid, derived from the federal excise taxes upon arms, ammunition and fishing tackle. The 11 per cent tax on guns and ammunition, and the 10 per cent tax on fishing tackle, are appropriated back to the states on the basis of the size of the state and the total number of licenses sold in the state each year.

In the material that follows, the income and expenditures for fish and game are presented in graphic and summary form. The figures are the anticipated income and anticipated expenditures for the fiscal year of April 1, 1957 through March 31, 1958.

WHERE THE MONEY COMES FROM

Estimated Income 1957-1958

Type of License	*Amount*	*Per Cent of Total*
Hunting licenses ...	$2,320,000	45.2
Fishing licenses	1,665,000	32.4
Trapping licenses ..	23,000	.4
Miscellaneous licenses, sales, etc.	186,000	3.6
Fines and penalties..	112,000	2.2
Federal Aid—wildlife restoration	670,174	13.0
Federal Aid—fish restoration....	161,720	3.2
	$5,137,903	100.
Unexpended balances and cash on hand.	647,859	
Total	$5,785,762	

The 1957-58 income is estimated to be about the same as that received during the past fiscal year because no appreciable increases from the present sources of income can be anticipated.

WHERE THE MONEY GOES

Estimated Expenditures 1957-1958

Area of Expenditure	*Amount*	*Per Cent of Total*
Administration	$327,310	5.7
Staff Services	183,676	3.2
Salary Adjustments..	113,000	2.0
Care and Management	140,000	2.4
Fish	1,613,974	27.9
Game	1,905,923	32.9
Law Enforcement...	1,425,913	24.6
Marine Fisheries ...	75,966	1.3
Total	$5,785,762	100.

The following is a more detailed analysis of estimated major expenditures:

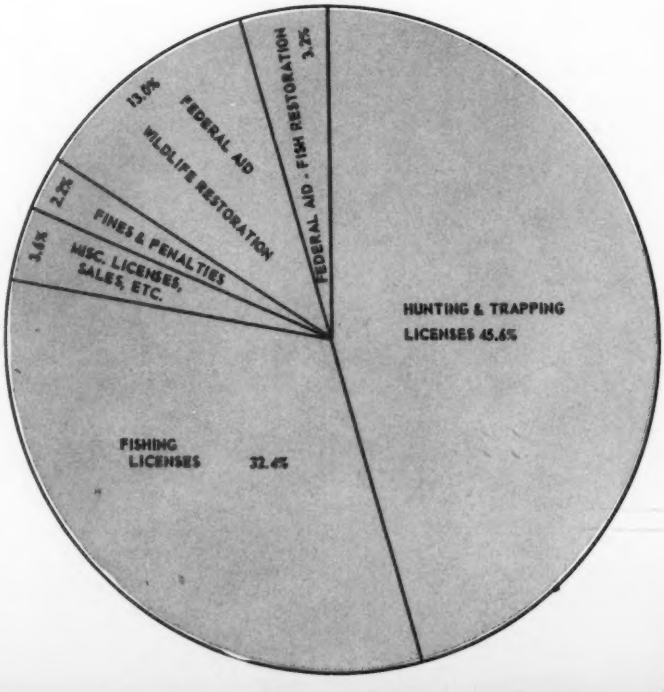
Administration

Includes cost of operating Division office, printing and distributing the Hunting and Fishing Guides and Fish and Game Law, employment of temporary help during periods of illness or vacation of regular personnel and payments for compensation insurance, pensions and retirements for all personnel in Division of Fish and Game.

Staff Services

Finance	$51,740
Engineering	44,884
Technical publications	18,372
Conservation Education	68,680
	$183,676

Income


FEDERAL AID - FISH RESTORATION 3.2%
13.0% FEDERAL AID WILDLIFE RESTORATION
2.2% FINES & PENALTIES
1.4% MISC. LICENSES, SALES, ETC.
HUNTING & TRAPPING LICENSES 45.6%
FISHING LICENSES 32.4%

Finance: Covers cost of handling fiscal operations such as keeping proper records of income and expenditures, and processing requisitions, payrolls, bills and other financial transactions and the cost of printing and distribution of the hunting, fishing and trapping licenses.

Engineering: Covers cost of engineering services for construction, rehabilitation and improvement projects in Division of Fish and Game.

Technical publications: Covers cost of preparing the Fishing and Hunting Guides, the Fish and Game Law and other technical reports and the cost of editing and printing the *New York Fish and Game Journal.*

Conservation Education: Covers the cost of operating the Conservation Boys' Camps and the Hunter Training Program.

Salary Adjustments

The appropriation of $113,000 was made to cover salary adjustments resulting from increased pay rates enacted by the 1957 Legislature.

Care and Management Fund

This sum of $140,000 is available to meet emergencies and to undertake unexpected work which may arise during the year.

Fish

Management

Fisheries districts	$236,703
Salvage operations	113,762
Stream improvement and development of lake access sites	75,000
Acquisition of fishing rights and lake access sites	50,000
Federal Aid program (improvement, construction of fishing lakes, and water chestnut control)	*177,780
	$653,245

Propagation

Operation of 21 fish hatcheries	$855,090

Research

Pollution, fish disease and fish nutrition studies	$67,780
Federal Aid program (includes farm pond, warm water fish management, carp control, selective breeding of trout, improvement of fish cultural techniques, and marine fisheries investigations and studies)	*176,980
	$244,760

* The Federal Aid appropriations total $139,121 more than current year appropriations. These are moneys which were unexpended last year and are available for use this year.

Game

Management

Management districts	$495,814
Development and improvement of Game Management Areas	50,000
Construction and rehabilitation on Game Management Areas	25,854
Federal Aid program (includes habitat improvement on private lands, game management areas, and state forests, and land acquisition)	**764,240
	$1,335,908

Propagation

Operation of six game farms	412,299

Research

State appropriations	28,391
Federal Aid program (Includes pheasant, waterfowl, deer, bear, coyote, rabbit, hare, animal disease and habitat improvement studies and investigations)	**173,140
	$201,531

** The Federal Aid appropriations total $43,815 more than current year appropriations. These are moneys which were unexpended last year and are available for use this year.

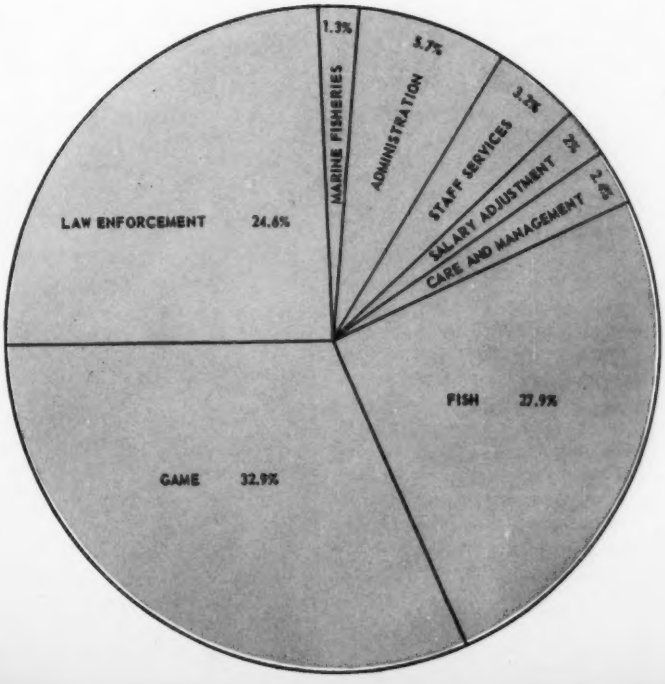
Law Enforcement

Operations of 171 Game Protectors, 16 Assistant District Game Protectors and eleven District Game Protectors	$1,425,913

Marine Fisheries

Issuance of commercial licenses and operations of five Marine Fisheries Protectors and the District Marine Fisheries Protector	$75,966

Expenditures



A comparison of income and expenditures shows that the 1957-58 budget is a tight one without provision for operating reserves. Expenditures will have to be watched closely during the year. If income is less than anticipated, then expenditures will have to be cut accordingly.

What are not immediately apparent, are the programs that should be expanded but cannot be with the present income, the retrenchments in existing programs which will be necessary if price of labor and materials continues to rise and increased funds are not available, and the new programs that should be undertaken but for which funds are not available. These subjects and others related to the adequacy of the present fish and game program will be discussed in a forthcoming issue.

—W. M. LAWRENCE,
Asst. Director, Division Fish and Game

Forests and Water in

2nd cover theme—the rain falls gently to earth beneath the trees, its force broken by limb and leaf

With good watershed cover there is greater assurance of clear streams

WHEN the first American pioneers began to move slowly westward from the Atlantic coast, all of what is now the eastern United States was a wilderness, almost completely covered with forests. The only native inhabitants were a thinly scattered population of Indians, who depended on the forest rather than on cultivation for a livelihood. It is certainly safe to say that in those days no problems of floods or water shortages existed. For one thing, the uplands were well covered with vegetation, so that there could have been little surface runoff and erosion; and the smaller streams must have been well stabilized. In addition, the rich bottom lands of our eastern rivers were not occupied by farms, villages or cities, so that no damage resulted even when high water did occur.

As the white people moved westward, however, they cleared great areas of the natural forests, converting them to pasture and cropland. As a result, only half of the original area of the eastern United States is still in forests; and the remaining forest has been largely cut over, grazed, and burned, so that today it is generally in poor condition. On the other half of the land, clearing and subsequent cropping inevitably reduced the capacity of the soil to take in water. The result, speaking for the East as a whole, has generally been accelerated surface runoff and erosion, and flashier, muddy flood crests in the streams.

The flood and sediment problems produced by these activities have been aggravated by the settlement of people along the river bottoms; the development of rich farms, protected in part by levees; and the growth of towns and cities along the rivers, using the water for domestic and industrial supplies as well as for commerce and for the dumping of sewage. The intensifying development of cities has incidentally brought a constantly increasing number of problems of water shortages. These are now being further aggravated by the spreading of air conditioning in cities, and by the beginning of irrigation on eastern agricultural lands.

In New York State, the invasion of the white man has been like that in other areas in the eastern United States. Of the 30 million acres of land in the State, now less than one-half are covered with forests, including 3 million acres in small farm woodlots. As in other places, this remaining forest has been progressively deteriorated by repeated high-grade cutting and by fires.

Obviously this attrition of the State's forest land and the growth of agriculture must have had definite effects on water supplies, floods, and erosion rates. These effects are distinct in some areas, especially where natural conditions favor the development of watershed problems. Such natural conditions are the existence of shallow, impervious soil, combined with the freezing of soil in the Winter, the occurrence of rapid Spring thaws and snow-melt, and heavy rains during the Spring and Summer. In areas such as these, floods and erosion have presented serious problems for many years. Examples are watersheds in the upper Susquehanna River basin, such as the Unadilla River.

In less sensitive areas of the State, the bad effects of watershed deterioration are less noticeable. Such watersheds can be found in the Finger Lakes region and the area around Syracuse, where local flood and sediment problems exist on tributary streams, due to the removal of timber and to poor farming practices. Most of these streams, however, pass through rural areas, and natural flood control storage is provided by numerous lakes. Accordingly, the flood and erosion problems are not exceptionally serious as compared to other areas within and outside New York State. Take the Limestone Creek watershed, for example, which occupies an area of about 60 square miles southeast of Syracuse, and whose stream passes through the villages of Manlius and Fayetteville on its way to Chittenango Creek and Oneida Lake. This watershed contains definite rural problems of land deterioration, with surface erosion and bad stream conditions including some pollution. At present, however, flood problems are not considered serious enough for the U. S. Department of Agriculture to provide assistance in the development of a remedial program under the Watershed Protection and Flood Prevention Act of 1954 (Public Law 566).

In any consideration of New York State problems of water and soil, the focus of inquiry invariably moves rapidly to the Adirondack and Catskill areas. There are several excellent reasons. For one thing, these beautiful mountains are the source of several major rivers of New York State, and of the water supply for the most densely developed urban areas in the State. In addition these areas are still largely forested, especially the Adirondacks, which are characterized by large areas of rugged mountain slopes completely covered with timber. Much of this forest was ravaged by logging and fire in the Nineteenth Century, resulting in the present extensive areas of deteriorated second-growth hardwood forests.

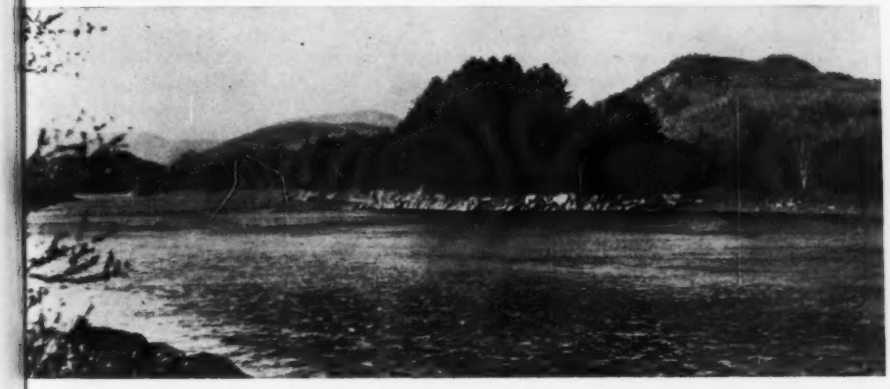
Poor pastures need restoration to make good watersheds. Limestone Cr., Cen. N.Y.

New York State

by H. G. Wilm, *Associate Dean, State University College of Forestry, Syracuse*

As a hydrologist attempts to analyze watershed problems and relationships in the Adirondacks, he finds the situation complicated by the intermingling of privately-owned lands within the boundaries of the same watersheds which contain large tracts of State-owned lands. Expanding areas of preserve lands have been protected as well as possible, since the establishment of the first preserve lands almost three-quarters of a century ago; privately-owned areas, on the other hand, have been affected by more recent logging, and by the development of roads and communities. Complicating these conditions is the fact that streamflow records are mostly short in duration or record the yields for very large watersheds, containing a great variety of terrain and development. As a result, any quantitative analysis of the influence of watershed deterioration on water supply, floods, or sediment production is likely to show only inconclusive results. Some preliminary analyses with which I am acquainted, for example, show no perceptible effects of forest manipulation, nor any appreciable change in streamflow over the past 25 years.

Using experience gained in other regions of the United States and Europe, however, it is possible to take a rational approach to Adirondack problems and supply some inferences as to the effects of past logging and fire, or of the future protection or management of the area. This can be done by examining the general environment of the Adirondacks, including its climate, its past and present vegetation, and its soils and geology.



Above, lumbering, grazing, burning on the upper watershed have subjected this valley to flash floods and erosion. Below, where it leaves the Adirondacks, the Hudson River is a beautiful stream

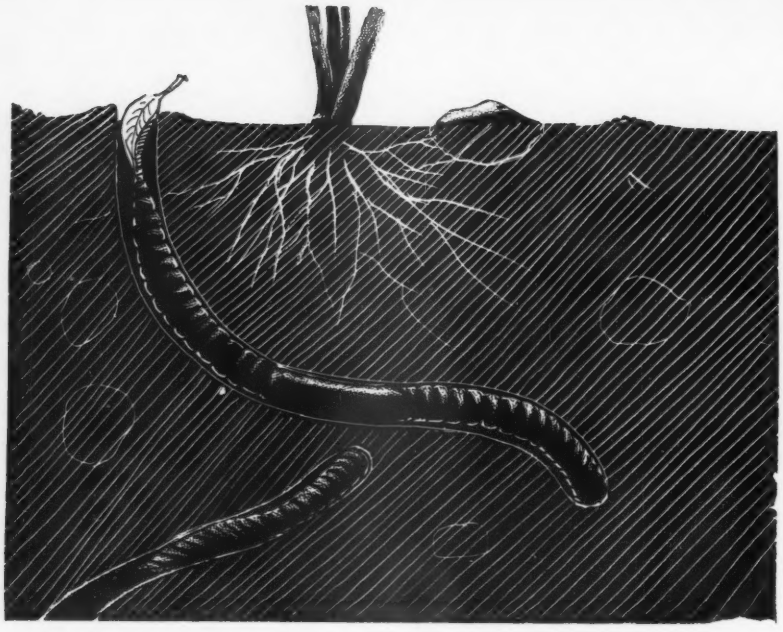
The climate of the general Adirondack area—and of much of the rest of New York State—is "hydrologically gentle." This means that the region is not characterized by destructive meteorologic events such as highly intense storms or extremely rapid thaws. On the contrary, precipitation rates are generally gentle; the annual precipitation is well distributed over the year; and much of the water yield is from an abundance of Winter snow which melts with relative slowness in the Spring.

The original cover of vegetation was certainly a well-developed, generally mature forest of hardwoods, mixed-woods, and spruce-fir much like what is found today in undisturbed areas. This forest must have intercepted 30 to 40 per cent of the Summer precipitation, and thereby decreased water yields. In the Winter, however, because it was largely leafless, interception rates must have been small. With cool Summers, and rather shallow soils providing comparatively little storage for water on the mountain slopes, total transpiration and evaporation losses must have been correspondingly low. As a result, water yields must have been at least half of the total precipitation of somewhat over 40 inches, just as they are today.

As to soils and geology, the characteristic aspect of the Adirondacks is an abundance of well-drained outwash sands and glacial tills, with considerable porosity but relatively shallow depth. These are interspersed with valley-bottom deposits of deep, wet soil forming the foundation for marshes and wilderness tarns or lakes.

When the original forest was removed by progressive logging and fire, certainly there must have been an abrupt change in hydrologic conditions on the logged and burned area, at least for a time. While evaporation from the soil was doubtless increased, transpiration was greatly decreased; the soil surface may have become puddled and compacted in places, and there may have been substantial amounts of surface runoff. In addition, fire must have destroyed the superficial deposits of organic humus, litter, and peat which normally develop under a virgin forest. As a result, it is quite likely that soil permeability and storage were decreased by these destructive operations. These effects may have resulted in a semi-permanent increase of flood flows, and a corresponding decrease of low-water Summer flows.

(Continued on page 34)



Bait in Your Basement

by Jean H. Glick

EVER watch a small boy getting ready to go fishing? Even before he begins to wonder where he left his pole the last time he went fishing, the very first thing he does is arm himself with a shovel and an old tin can; then dig for worms. When he unearths some he's in business; but, unfortunately, worms are not always available in sufficient quantity for a day's fishing. No one knows just when worms were first used as bait, but whenever it was they have been a pre-requisite for fishing ever since.

Today's young fisherman does not find digging for worms quite as simple, however, as the pole-and-line artists of a few years back. The fields and vacant lots that once were "oozing" with worms are now covered with industry and housing projects. Piscatorial-minded adults also find the ugly holes digging makes in the backyard (or the neighbor's) aren't exactly welcome either. Isn't it strange then, that anglers who spend long Winter evenings working over their tackle in preparation for the fishing season never give a thought to raising worms in an indoor bed in the basement or garage?

Not only is it an interesting hobby that assures one of a plentiful supply of bait without a lot of back-breaking effort, but it often proves to be quite profitable. While the price varies with the season of the year, small worms usually sell for 15¢ to 50¢ per 100, while larger ones, or night crawlers, bring anywhere from 25¢ to $1 per hundred. Many anglers pay as much as 25¢ per dozen at the height of the season, regardless of size.

Perhaps this doesn't sound like the foundation of a "get-rich-quick" scheme but do consider the fact that a container approximately two feet in diameter and one foot in depth will produce approximately 5,000 to 6,000 worms; and, since the space required is so small, any number of beds is possible.

The container used for an indoor worm bed should preferably be of metal. Wood is apt to rot or swell, exposing cracks and allowing dirt and worms to escape, which might bring a quick end to an otherwise interesting hobby. Tin or galvanized tubs, or old metal drums cut lengthwise serve to make excellent containers; however, they should first be coated with hot asphalt or, in lieu thereof, two coats of house or deck paint may be applied to prevent objectionable rusting.

Soil preparation is very important. Sandy soil has not been found to be satisfactory and it is thought that perhaps the sharp edges of the sand do harm to the digestive tracts of the worms. A loamy soil is considered preferable, and dead leaves or rotted straw are excellent additives, although not absolutely necessary. If used, the straw or leaves should be added in the ratio of 3 parts soil to 1 part straw or leaves, and can either be mixed through the loamy soil or placed on top of it in the container. Some breeders prefer to keep their worms in only moist, dead leaves. Any kind will do but worms seem to thrive better in dead elm leaves.

The soil mixture, or dead leaves, whichever is preferred or available, should be placed in the prepared container to a depth of 8 to 10 inches, then finally the worms added. Mixing the worms directly into the soil is neither the most effective nor simplest way because the injured ones may die and decay, creating an objectionable odor and endangering the others. They should be placed right on top of the soil as the healthy, live worms will burrow to the bottom and the dead ones will remain on top and can be removed and discarded. With proper care worms should never present an odor problem.

Worm raisers almost universally use coffee grounds in their soil mixture although whether or not the worms actually consume the grounds is questionable. All worm raisers do agree, however, that worms do better when coffee grounds are mixed in the soil. They may be added any time the coffee pot is emptied; however, the grounds should always be allowed to cool and partially dry before being added.

Getting Worms

There are several ways of obtaining worms for a worm bed, even that of buying them at the local bait store; but one of the best methods seems to be by the use of a lantern or flashlight at night, usually after 10 p.m. A golf course or school yard provides an excellent area of search, but any damp, moist ground will usually contain many earthworms stretched out on top of the ground to several times their normal length. If a flashlight is used it is advisable to cover the lens with a piece of tissue paper to deflect the rays, or a red lantern may be employed instead. An earthworm will normally leave one end of its body remaining in the ground and will disappear very quickly into its burrow when direct rays of the flashlight are shown upon it. Nothing moves much faster than a frightened earthworm, so it is not the time to be squeamish about touching them no matter how slimy they may feel to the touch. Regardless of how well-fitting

a pair of gloves may be, they are too cumbersome for the agility and speed needed to catch worms. The tug-of-war exerted by an earthworm trying to escape often results in a very difficult session of separating the earthworm from its burrow and not infrequently, unless care is used, separating the earthworm from part of itself.

While hunting by flashlight or lantern seems to be the most effective method of obtaining worms for a bed they are sometimes brought to the surface by hammering on a stake which has been driven into the ground to a depth of 10 or more inches. Another method is to tap a hammer directly on the surface of an area where worms are thought to be present.

Feeding Worms

There have been many diets suggested for healthy earthworms, such as eggshells, citrus rinds, pablum, garbage, crusts, and even newspapers; but it is quite generally agreed that worms do very well on a mixture of one pound of the cheapest grade of vegetable shortening or lard and two pounds of corn meal. It can be mixed either by hand or with a pastry blender until the shortening or lard is well distributed through the cornmeal. This amount will feed 5,000 worms for a month. It should be applied at two-week intervals by sprinkling over the top of the worm bed. If dead leaves are used in the worm bed instead of a soil mixture the worms will not need additional feeding as they will feed on the dead leaves, although it is advisable to occasionally feed them a little fat in the form of chopped beef suet sprinkled over the top of the bed. When the suet has disappeared it is time to add more. Whatever diet is decided upon it is very important to spread the food sparingly over the soil or the uneaten food is apt to decay and foul the soil, killing the worms.

Water should be added periodically to maintain a proper moisture condition. It is a good idea to give the worms a check every time they are fed, but it should be done very carefully so as not to disturb any existing egg capsules. The need for water can largely be determined by the position of the worms in the bed. If the worms are near the top, it is too wet; if they are near the bottom, it is too dry. For the perfect moisture condition the worms should be midway in the soil mixture. It is usually necessary to add about one quart of water every two weeks; however, since the need will vary the water should not be added all at once as it is very important not to add more than the soil will absorb. One pint can be sprinkled over the surface with the hands and if it is all absorbed another pint may be added. Strips of burlap or wood placed on top of the container will serve to prevent evaporation. If worms are kept in only dead leaves the strips of burlap or wood should be held down with a heavy object, such as a brick, in order to compress the leaves. This will further assist in preventing evaporation since leaves tend to dry much faster than soil. Some breeders also place a strip of burlap on the bottom of the container to take care of any excess moisture.

Worm babies begin to appear in about 3 to 5 weeks. The gelatin-like cocoons from which baby worms hatch are so small that approximately 150 will fit in a teaspoon. They are extremely fragile so it is advisable not to get too "nosey" concerning the growing family. To satisfy the curiosity, an occasional peek should be sufficient; however, extreme care should be utilized not to disturb the soil mixture or leaves any more than is necessary in order to prevent damage to the egg capsules. The best time to look for young worms is when food and moisture is added, and not to poke around at other times.

Young worms have adult characteristics when hatched and grow progressively larger, but they can be easily distinguished from breeders. The adult worm has an enlarged band or swelling about one-third of the way back from the head, containing both male and female reproductive organs. Self-fertilization does not occur however; when a pair breeds each fertilizes the eggs of the other. Worm babies mature and become breeders in about 5 months, and in a year a tub two feet in diameter will have produced 3,000 to 5,000 worms.

If additional beds are desired the soil mixture in the original bed should be covered with a mulch of finely crushed leaves. This mulch should be kept moist, and egg capsules will then be laid in it. The mulch containing the egg capsules, and the soil just below it, can be transferred very carefully to new beds where the wormlets will hatch. By having several beds it is possible to keep one as a "private stock" just for fishing jaunts.

The most important thing to remember in raising or storing worms is that they must be kept at a temperature of 60° or lower. Temperatures of 70° to 75° are fatal to worms. This is no problem in the Winter, but in Summer some basements become warmer than the desired 60° maximum. The moisture condition should be watched very closely at these times as addition of water will be very helpful in cooling the soil mixture. Another method of keeping the worms cool is to line the container with cork and

waterproof it by covering the liner with paraffin. A canvas "cover-all" should be placed around the outside of the container which can be kept moist. The cork will act as an insulator from the heat and evaporation of water from the canvas will keep the worms cool.

Worms may be marketed directly from the container, but to make them livelier and more desirable bait it is a good idea to "scour" them before they are used or sold. Not only does scouring make them more attractive to the fisherman, but the worms will live longer on the hook and be more attractive to the fish. To do this, dampen an old lace curtain and place in the bottom of an earthenware crock or other container. To remove the worms from the worm bed for scouring, the soil mixture in the bed should be tossed loosely into a bucket. The bucket should be allowed to set undisturbed for 30 minutes, preferably longer, and the soil on top removed and returned to the worm bed as it contains the egg capsules. Almost every worm will be found on the bottom of the bucket due to their habit of crawling downward in loose soil. This process can be continued until the desired amount of worms is obtained. Another method is to empty the worm bed and sort out the worms of suitable size. The soil mixture containing the egg capsules is saved and returned to the bed. The worms for scouring should then be put in the crock or earthenware container for 2 to 4 days. At the end of this time they should be very lively and almost transparent. If it is found necessary to leave them in the crock for longer periods of time a little sweet milk should be sprinkled over the worms once a week for food and the curtain rinsed in clear water and wrung out every few days, or it is apt to become sour and smelly. Fresh water on the curtain will also serve to keep the worms cool.

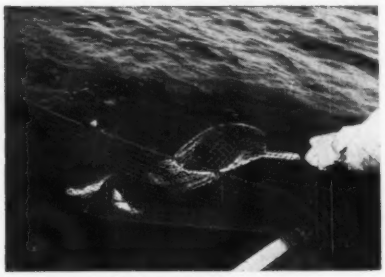
Next time you want an interesting hobby, or an outside interest that will take very little time but also bolster the pocketbook, give a thought to an indoor worm bed—and hang out your shingle, "Worms for Sale."

A boat count from the tower

Fisheries Biologists Take the Pulse of New York's Most Productive Lake

Electric shocker crew at work

Oneida Lake Fisheries Research



Trap nets help in population study

A fisherman and his catch

by Alfred W. Eipper,
Project Leader

EIGHTY square miles of upper New York is occupied by Oneida Lake, the largest body of water entirely within the boundaries of the State. Although 21 miles long by 3 to 5 miles wide, Oneida has a maximum depth of only 55 feet, with average depth less than half that figure. Warm shallow water and an abundant supply of nutrient materials continually being replenished by streams draining a vast watershed combine to make Oneida the State's most fertile lake, and probably the most productive large body of water in the entire Northeast.

Because of its tremendous fertility, Oneida Lake produces tons of fish annually—some 60 different species in all. And this, of course, attracts tons of fishermen. Spanning most of the distance between Syracuse and Utica-Rome, and lying only a few miles north of the Thruway, Oneida is within easy reach of a vast fishing public. To this add: A gentle topography, three public access sites, over 30 boat liveries, about 5,000 homes and cottages and a network of roads surrounding the lake. Result: One of the heaviest year-round concentrations of fishermen to be found in this part of the country. Fishing in one form or another goes on year-round and, from May to October, day and night. Boat counts and fisherman checks in 1956 indicated that during the months May through September roughly 1 million man-hours of fishing were spent on Oneida Lake.

The importance of the Oneida fishery was well known, and biological investigations of varying kind and scope had been conducted by State and other agencies for a number of years. Recently, however, the opportunity to conduct a more intensive research program appeared. Financially this was made possible by passage of the Dingell-Johnson Act, by which moneys from a 10 per cent federal tax on fishing equipment is used by the U. S. Fish and Wildlife Service to give financial aid for fisheries research projects conducted by state conservation departments. The ideal physical set-up for the study appeared when an ex-Cornellian, Charles E. Brown, willed his estate at Shackelton Point to Cornell University. This estate, strategically located midway along the south shore of Oneida Lake, includes some 30 buildings and 400 acres of land. In due course it was placed in the hands of Cornell's Department of Conservation, and given the imposing title Cornell University Biological Field Station.

Both the money and the physical plant for an intensive fishery study of Oneida Lake were now available, and in April, 1956 the three agencies involved pooled their resources to create the Oneida Lake Fishery Investigation. Officially, this is conducted on contract by the University for the State Conservation Department, with generous financial assistance from the U. S. Fish and Wildlife Service. The study is under the immediate supervision of Dr. John Forney, assisted by Marvin Grosslein and from 1 to 5 field aides, the number varying with the season.

Primary object of the Oneida study is, naturally, to produce the best possible fishing in the lake. This breaks down conveniently into two specific objectives:

First: To obtain the information needed to put fishery regulations on a sound basis of biological facts. In other words, to develop a program for maximum harvest of the present crop of desirable fish in Oneida Lake without endangering future crops.

Second: To find out what steps can and should be taken to increase the present rate of game and pan fish production in the lake.

To get these answers, a lot of information has to be collected, and over a period of several years. In a general way, sound

fish management has a lot in common with sound business management. To do either, you need an inventory of stock on hand. Then you must take a long and careful look at the factors which tend to increase production, and those tending to decrease production. In the fish business, the main items on the credit side of the ledger are rate of reproduction (increase in numbers) and rate of growth (increase in pounds). Principal factors which reduce the crop are harvesting by man, and death from natural causes. Then there's another large category of information on a variety of factors that have less direct—but important—effects on the ones already listed. These are things like the kinds of food eaten by various fish and the abundance of these food supplies, relationships between different fish species, and the way various populations in the lake are distributed and move around.

Let's take a look at some of the methods used by the biologists to obtain this needed information. When walleyes were netted this past April for annual spawn-taking operations at the Constantia Hatchery (on Oneida's north shore), Cornell biologists tagged and released 1,500 fish, and marked an additional 12,000 walleyes by fin-clipping before release. What do we get out of this? Fin-clipping identifies a large group of fish. In fisherman checks and test netting later in the season, a tally is kept of the clipped and unclipped walleyes encountered. With the totals in these two categories, plus the number of clipped fish originally liberated, it's possible to estimate the total number of walleyes (of the size range originally clipped) in the lake. If the numbers of clipped and recaptured fish are large enough, very reliable 'population estimates' can be obtained by this method.

Tagging gives information on individual fish. How they grew and where they travelled between release and recapture, and (from the per cent of tags liberated which were returned) a minimum estimate of the percentage of fish harvested by fishermen in a given year. Bass taken for spawning at Constantia are also tagged (about 500 a year) before being released in Oneida again in June. Additional walleyes and bass, obtained by various methods, are tagged and released in other parts of the lake to get additional information on the movement and distribution of different populations. Cooperation of Oneida fishermen, coupled with vigorous support from the 6,500-member Oneida Lake Association, have done much to increase the volume of information obtained from the tagging program.

Data on food habits, age structure, sex ratios, growth, and relative abundance of the different Oneida fish populations are obtained by sampling of these populations with various kinds of fish-getting devices. Among these devices are seines, gill nets, trap (or pound) nets, and an electric shocker. The trap net and electric shocker are illustrated in accompanying photographs. This Summer, Project biologists plan to try out still another gadget —an "electrified otter trawl." This is a deep-water device consisting of several vertical electrified rods towed behind a boat and close to the bottom. Behind the electrodes comes a large bag-shaped net (otter trawl). The theory is that fish temporarily stunned by the electric field drop back and are collected in the net as the whole apparatus moves along.

Determining the total yearly harvest of bass and walleyes in a lake the size of Oneida takes a lot of work. This is the general method: At frequent intervals during each week, all boats fishing on the lake are counted by an observer with a telescope atop a 70-foot tower at Shackelton Point. From these counts, the average number of boats fishing during a given period of time can be calculated. On four of every seven days, eight hours are spent in "creel census," which means contacting boats throughout the lake to find out how many of various kinds of fish were taken by each party, and in how much fishing time. This information leads to daily and weekly averages for (1) hours fished per boat, and (2) catch per boat-hour. The final step is to multiply (for, say, a 7-day period) number of boats times hours per boat to get total boat-hours fished on the lake during the week in question. Multiply this figure by the average catch per boat hour for that same week and you have the approximate total catch for that week on Oneida Lake. The same general principles may be used in figuring the ice-fishermen's catch on Oneida Lake, except that there you're working with men on the ice (also counted by telescope) instead of boats on the water. In either case the key to success, as in any other survey, lies in contacting a large enough and representative enough cross-section of Oneida fishermen.

So much for methods. Results are still largely in the future, since intensive fact-gathering is only now getting underway. For that matter, research on warm water fish management is in general a newcomer to the science of fishery biology. But although young (particularly in the Northeast), it's a field which should—and must—grow fast in this country, where an increasingly large majority of available fishing is for bass, walleyes, perch, and other species of similar environments.

ED. NOTE.—A hydrograph (fisherman's) map in reprint form of Oneida Lake is available upon request, from the CONSERVATIONIST. On the reverse side of reprint is a comparable map of Lake George.

The Case on Lake Brook

Rubbish dumped in a Schoharie County trout stream in violation of the Conservation Law. The violator paid a $25 fine and removed the rubbish

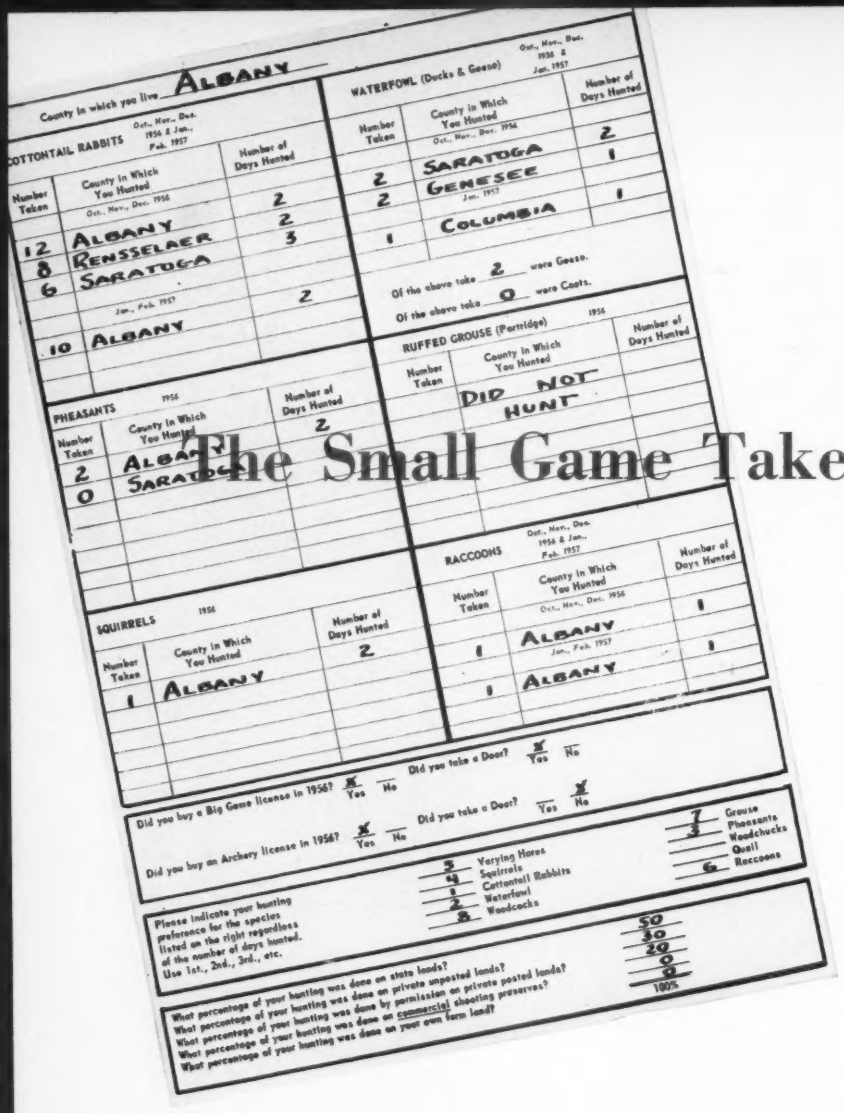
WE know of nothing better calculated to arouse the wrath of all who love clean waters and who have a feeling for the out-of-doors in general than the sight of heaps of garbage, tin cans, broken bottles and junk dumped into a stream. Last year something was done about it. The Legislature passed and the Governor signed a bill amending the Conservation Law to prohibit the disposal of earth, soil, refuse or other solid substances, except snow and ice, in any stream or tributary thereto which is inhabited by trout.

And this Spring, the Department's Bureau of Law Enforcement acted upon that amendment to post their first case under this new section of the Law. The violation occurred in the Town of Broome, Schoharie County where, on February 16, the owner of a local tavern dumped the rubbish pictured above into Lake Brook, a tributary of Catskill Creek.

Apprehended by Protector DeLaMater of the Albany Division, the tavern keeper settled by stipulation on February 28, 1957 for $25 *and* agreement to return to the stream, pick up and remove all the garbage and rubbish dumped at that site —an act that was witnessed, with considerable pleasure, by the Game Protector.

An interesting sidelight on this case, and a reflection as well, on the short-sightedness of some of our citizenry, is the fact that the violator in this instance depends in large part upon the patronage of sportsmen who fish the very stream he was doing his best to despoil.

The Small Game Take


County in which you live ALBANY
COTTONTAIL RABBITS
Oct., Nov., Dec. 1956 & Jan., Feb. 1957
Number Taken
County in Which You Hunted
Number of Days Hunted
12 ALBANY 2
8 RENSSELAER 2
6 SARATOGA 3
Jan., Feb. 1957
10 ALBANY 2
WATERFOWL (Ducks & Geese)
Oct., Nov., Dec. 1956 & Jan. 1957
2 SARATOGA 2
2 GENESEE 1
Jan. 1957
1 COLUMBIA 1
Of the above take 2 were Geese.
Of the above take 0 were Coots.
PHEASANTS 1956
2 ALBANY 2
0 SARATOGA
RUFFED GROUSE (Partridge) 1956
DID NOT HUNT
SQUIRRELS 1956
1 ALBANY 2
RACCOONS
Oct., Nov., Dec. 1956 & Jan., Feb. 1957
1 ALBANY 1
Jan., Feb. 1957
1 ALBANY 1
Did you buy a Big Game license in 1956? X Yes No Did you take a Deer? X Yes No
Did you buy an Archery license in 1956? X Yes No Did you take a Deer? Yes X No
5 Varying Hares
4 Squirrels
1 Cottontail Rabbits
2 Waterfowl
8 Woodcocks
7 Grouse
3 Pheasants
Woodchucks
Quail
6 Raccoons
Please indicate your hunting preference for the species listed on the right regardless of the number of days hunted. Use 1st., 2nd., 3rd., etc.
What percentage of your hunting was done on state lands? 50
What percentage of your hunting was done on private unposted lands? 30
What percentage of your hunting was done by permission on private posted lands? 20
What percentage of your hunting was done on commercial shooting preserves? 0
What percentage of your hunting was done on your own farm land? 0
100%

IT'S a little early to predict, at this writing, just how small game hunters will fare in New York during the season of 1958. But whatever the prospects may be, they'll be in for one pleasant surprise—a streamlined, face-lifted license form; a license of substance to fit handily in the wallet, replacing the tissue flimsy that's served these many years.

And there's more to this new license than meets the eye! Or perhaps it's better to say there will be less to the mechanics of issuance. For one step in the streamlining is the abandonment of the game tally stub which the issuing clerk was supposed to fill out as he quizzed the license applicant on his luck of the preceding hunting season. This guessing game, where it was still being played, was always good for a laugh. The clerks never believed a word of the tally reported—and that went for the licensee as well. The alleged take varied from absolutely nothing, suggestive that the gunner used nothing but blanks all season, to reported kills that would have turned pioneer buffalo hunters green with envy. Actually, the majority of license clerks had long since quit playing the game at all; no doubt sensing that the information—or misinformation—secured was all but worthless.

However, good or bad, the Department, having asked the questions, was obligated to keep its part of the bargain by trying each year to analyze these fairy tales. It did so—at considerable clerical expense and with a degree of accuracy no greater than the licensee's individual guesstimates.

But such hunter-take-tallies, when accurate, are of tremendous value to game research men and game managers alike. As an example, the system developed to accurately check the deer kill each year, on a zonal, county and even a township basis, is essential to setting proper seasons and other management measures. The lack of accuracy in records of small game harvest has deprived game men of an extremely important gauge of the value of such management measures as have been applied or an index of the worth of others that might be tried.

But, if the cumbersome and expensive system used these many years wasn't providing the answers, what would? To find out, game administrators in all other states of the Union were asked how they got the answers. Of all the systems in use, that which operated most accurately —and most economically—was found to be a random sample questionnaire mailed each year to a representative number of licensees.

Accordingly, in 1956, the Department conducted a "pilot study" of 1,000 randomly selected licensees. Each was mailed a small game questionnaire similar to that pictured here. The response was exceptionally good and, with one follow-up, a return of 66.4 per cent usable returns was received.

The information from the survey was carefully analyzed to determine the number and distribution of hunters that would have to be contacted to secure an accurate index of take for the species desired. We found that it would be necessary to sample 7,000 small game hunters to secure reasonably correct information. The species listed (see cut) are those most often taken, having a statewide distribution and of paramount interest to game manager and small game hunters. It should be noted here that such species as varying hare, Hungarian partridge, quail, etc. would not lend themselves to statewide sampling because of their restricted distribution. Information on these species can be secured in a similar manner but on a restricted basis.

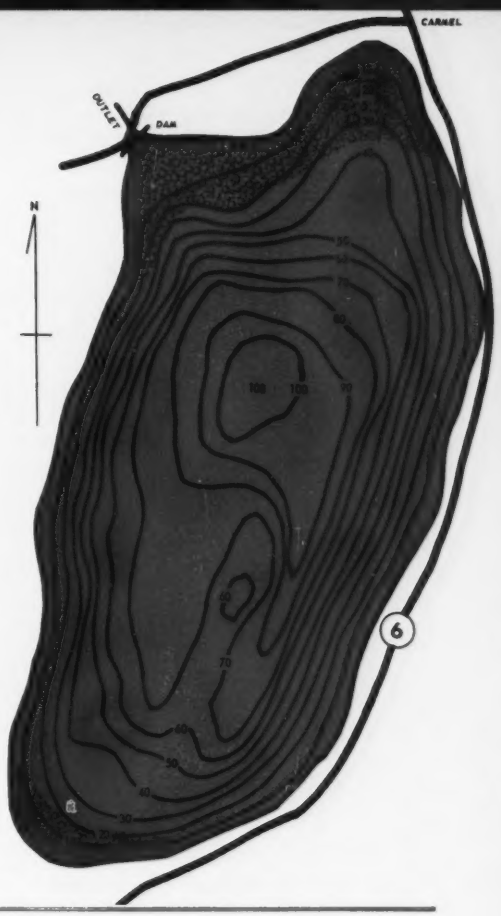
The Fish and Wildlife Service, having studied our pilot survey, has agreed to pay through Federal Aid (PR) three quarters of the cost of the sampling system covering the 1956 small game season.

To get this underway, 7,000 names have been selected from the license stubs of hunting and combination hunting and fishing licenses and these hunters are now being mailed questionnaires. Preparations have been made for the necessary follow-up and the tabulation and statistical analysis of the returns.

We hope that if you are one to receive such a questionnaire, you will give us, as accurately as possible, the benefit of your experience during the last hunting season. We are sure the results will be of considerable interest to you. And, we know the information will be of substantial use to the professional game men in following game abundance trends, hunters' habits and preferences and, in turn, managing more adequately our small game resources.

—A. W. BROMLEY

Lake Glenida



Location
Town of Carmel, Putnam County

Physical Features

Area: 185 acres
Elevation: 505 feet
Maximum depth: 108 feet

Chemical Conditions

pH: 6.8-7.5
Oxygen: Satisfactory for fish life except in deeper portions
Transparency: Clear

Fishes Present

Rainbow trout
Rock bass
Yellow perch
Chain pickerel
Bluegill, red-bellied and common sunfish
Barred killifish

General

Lake Glenida is part of New York City's water supply system
Rainbow trout are maintained through annual stockings. Chain pickerel are common and panfish are abundant

Regulations

New York State fishing license required. New York City Dept. of Water Supply, Gas and Electricity fishing permit required. New York City Dept. of Water Supply, Gas and Electricity boat permit required. Under the provision of Section 174 of the Conservation Law tip-ups may be used in this lake

—JOHN D. GOULD,
Aquatic Biologist, Southern Fisheries Dist.

Lake Gilead

Location
Town of Carmel, Putnam County

Physical Features

Area: 121 acres
Elevation: 498 feet
Maximum depth: 120 feet

Chemical Conditions

pH: 6.4-7.1
Oxygen: Suitable for fish life at all depths
Transparency: Clear

Fishes Present

Lake trout
Rainbow trout
Yellow perch

General

Rainbow trout are maintained through annual stocking. Lake trout are, at present, maintaining themselves

Regulations

New York State fishing license required. New York City Dept. of Water Supply, Gas and Electricity fishing permit required. New York City Dept. of Water Supply, Gas and Electricity boat permit required. Under the provision of Section 174 of the Conservation Law tip-ups may be used in Lake Gilead

—JOHN D. GOULD,
Aquatic Biologist, Southern Fisheries Dist.

Conservation Through

A Tri-State Compact's Successful Fight For

FORTUNATELY, many people are dedicated to the protection of our natural resources. The particular interest of an individual may vary within the broad area of conservation, but the group as a whole is vitally interested in the welfare of anything that swims, flies, crawls, clings, walks, runs, climbs, burrows or blooms. As a consequence, there is widespread public interest in the Interstate Sanitation Commission and in the work this Commission is doing to promote conservation through pollution abatement.

Man has defiled Nature from time immemorial and many ancient writings, including the Bible, admonish him regarding pollution. He has frequently made inefficient use of Nature's bounty, throwing to waste what he did not use. The very abundance of natural resources in these United States encouraged our forefathers to use them recklessly assuming that these resources were limitless. A prime example of resource misuse is that of water.

Waterways were of vital importance in the development of our country; often the only means of communication, the only artery of commerce to sustain our early population centers—not only the means—but the very reason for their existence. Yet, as important as were our waterways to the survival and well-being of early population centers, they soon carried waste of all kinds.

Fortunately for all of us, Nature is a tolerant mistress but when Man abuses to excess the privilege she grants, he is the loser. And so it is with water. Streams become unfit for use as a water supply for Man, for beast, for bird—and may even fail to support fish life. Eventually, when maltreated, they become so foul as to be unfit for nearby habitation.

So, Man, chastised by Nature, learns the need to control his excesses. He learns that he must not exploit Nature, but must rather co-operate. Great strides have been made to control Man's pollution—household, industrial.

To assure that all persons shall co-operate and contribute to the common welfare, guiding legislation has been enacted.

The manner in which such legislation is functioning on an interstate level in the New York metropolitan area is the story told in the accompanying article.—SETH G. HESS, *Dir., Chief Engr., Interstate San. Com.*

The Interstate Sanitation Commission is a Compact or Treaty between New York, New Jersey and Connecticut for the abatement of existing pollution and the control of future pollution in the waters of the New York metropolitan area.

It should be pointed out that waters under our jurisdiction are all tidal, posing a variety of problems not encountered in pollution abatement in the non-tidal, inland waters. Since the Commission was created in 1936, considerable progress has been made; due, primarily, to the remarkable co-operation of many agencies—particularly those charged with water pollution control in each of the three member states. In addition, there are agencies of the Federal government as well as state, interstate, county and municipal entities, that have worked hard to obtain these objectives. There are also many non-governmental agencies, associations and leagues, as well as the press, radio and television that have kept the public informed and supported the program. All have helped toward achieving the gains thus far made.

The Nature of Sewage Pollution

Sewage pollution in water is indicated by the presence of coliform organisms. Coliform organisms are used as an indicator because they are found in large numbers in the intestinal tract of humans. Although not harmful themselves, their presence warns that pathogenic bacteria, that cause such diseases as typhoid fever, dysentery and diarrhea, might also be present. Since coliform organisms are easier to detect by tests and harder to kill than pathogenic organisms, they serve as a good indicator to tell when pathogenic bacteria have been removed or killed.

In polluted waters, a flora and fauna composed of bacteria, protozoa, fungi and worms develop that utilize sewage as a source of food and, in the process, change unstable organic matter into a stable form. One group known as aerobic organisms use oxygen and the stabilizing of the pollution is carried on with the absence of undesirable odors. When oxygen is exhausted, another group known as anaerobic organisms go to work on the sewage with resultant offensive odors unmistakably advertising which group has taken charge. As long as there is sufficient dissolved oxygen present, the waters can carry on their self-purification. The greater the amount of pollution, the lower the dissolved oxygen is depressed.

Moreover, oxygen must be present for the survival of fish life; the amount needed varying with different kinds of fish. Therefore, areas designated as desirable for bathing, shell fish and fish culture must be protected by requiring sufficient treatment by sewage plants that discharge into these waters. Not only must these treatment plants prevent lowering the oxygen below Compact standards, but they must guard also against the presence of harmful bacteria that would contaminate these waters. The Commission makes routine dissolved oxygen and coliform tests to assure conformity with Compact standards.

As late as 1936, substantially no sewage was being adequately treated in the New York metropolitan area. A greater part was being discharged into these waters *without any treatment whatsoever*. At the present time, however, a total flow of more than 1 billion, 150 million gallons per day is being treated; a larger flow than the combined discharge of untreated *and* treated sewage discharged in 1936.

The Compact recognizes, that because of the varied use of water for bathing, navigation, shell fish culture, fishing and the disposal of wastes, no single standard of purity is economically practical. Accordingly, the waters were divided in two classes: (1) Class "A" in which the designated water is or is expected to be used primarily for recreational purposes, shell fish culture or the development of fish life; (2) Class "B" in which the designated water is or is expected to be used primarily for other purposes. Public hearings were held to apprise all of the findings of the Commission and to determine the desired classification of the waters in our district.

To accomplish these objectives, the Commission undertook a three phase program. Phase one is to abate the discharge of all untreated sewage into waters expected to be used for recreation and fishing. *That phase is 99 per cent complete.* Phase two is to abate the discharge of all untreated sewage into Class "B" waters. *This is over 73 per cent complete.* Phase three is to provide that all inadequately treated sewage discharged into the district be adequately treated as provided by the Compact. *This is over 89 per cent complete.*

Pollution Abatement

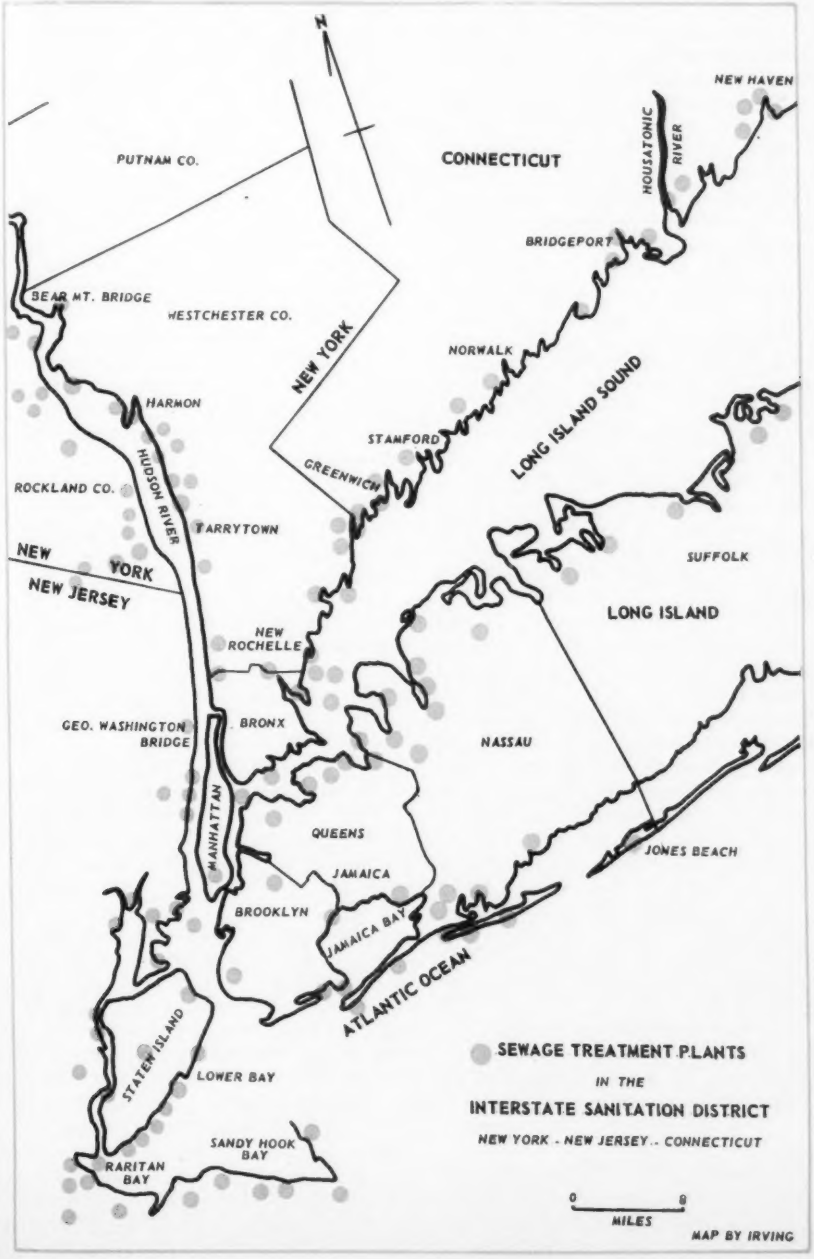
Clean Waters in New York's Metropolitan Area

by Thomas R. Glenn, Jr.,
Assistant Chief Engineer,
Interstate Sanitation Commission

There are other indications that progress has been made. One who has spent any time on or near the waters in this metropolitan area probably has noticed the reduction of floating matter. Fish life of some species, another index of clean waters, has returned.

Does the Interstate Sanitation Commission take credit for these improvements? No—the people of the area working through their governments and agencies of which we are but one, have brought about these changes.

Sometimes, of course, there is a conflict of interest in conservation work. For example, about two-thirds of the commercial duck farms of the United States are located on Moriches Bay drainage basin on Long Island. It is estimated that ten ducks contribute the equivalent pollution of one human. With hundreds of thousands of ducks in this area, the pollution has caused extensive algae growth and high coliform organism concentrations. The algae clogs the gills of the oyster and supports the growth of a parasitic, oyster-attacking worm. The coliform organisms prevent areas being approved for the taking of shell fish. The New York State Water Pollution Control Board with the co-operation of other agencies has been responsible for the development of a program of pollution abatement in this area, assuring that the ducks and shell fish shall both survive. Co-operation of this nature will further the cause of conservation for all.



It is reassuring to know that there are many who are studying the conservation of humans. A provision for human relaxation and enjoyment that bathing beaches and fishing areas afford cannot be underestimated. To be of greatest value, however, beaches must be near centers of population and to be near centers of population means to be near sources of pollution. Even beaches remote from cities become areas of large population on week ends and holidays during the Summer months. These large population fluctuations cause problems for the sewage treatment plants not encountered by plants in larger cities.

There are advantages and conveniences afforded by living in densely populated areas as well as some disadvantages. If this were not true, large cities would not exist. Therefore, we must have the support of all the people in our metropolitan area and especially the active participation of conservation-minded citizens to provide this chance for relaxation and good living through pollution abatement.

Looking to the future, the Commission has the following objectives:

1. To complete the remaining work now under way to bring treatment up to present standards,
2. To maintain an equitable use of the waters of the area through the changing years ahead,
3. To meet new needs as populations increase,
4. To cope with new industries and new types of pollution. There are, for example, such new problems confronting us as radio-active and chemical waste.

We are confident that with such objectives for the future and with your support, pollution abatement will permit the waters of this area to be put to maximum practical and multiple purpose use.

Sportsmen and Conservationists —

by JOHN DOUGLAS BULGER,

Director of Education, National Wildlife Federation

Sportsmen strike a blow for conservation on the Metawee River

Sportsmen club members busy on an apple grafting project

A good stream made better by simple diversion wing

ONE sunny June day, an unusual advertisement appeared in a small town paper. It asked if there were any farmers who needed help on their land to install permanent conservation practices.

A sportsmen's club made that offer and one farmer responded. For twenty-two years, he'd been fighting a river. He had lost! Five acres of his land had gone to sea and more was threatened by the river's seasonal thrusts. It could be countered only by work.

Sportsmen did the work. They sloped the bank, rip-rapped it with rocks, planted and mulched and wired down a cover of willows. The river's licked, at least for the time being. The farmer's happy. Needless to say, his land isn't posted.

In another part of the same state, forty volunteers from a sportsmen's club did a similar job.

One sportsmen's club is grafting apple trees, another planting odd corners for wildlife, yet another reforesting a burned-off area. In fact, if you examine sportsmen's clubs throughout the United States, you'll find them doing an encouraging amount of good work. But jobs like these mentioned may be the exception.

In fact, the activities you hear about more often are to *sponsor*, to *organize*, to *plan*. They are less often to *plow*, to *plant*, or to *do*.

Well, if we are going to have an adequate program of resource conservation either for club or for country, sooner or later somebody has to *do* something.

If we, as sportsmen, insist that conservation is for the professional, then our clubs are more social than conservation organizations. But if we're not ready to admit this, then we should bring at least one part of our club's program down to earth—the only place where natural resources are actually conserved.

Such a program would involve something the conservation movement needs and needs badly: A large number of persons who are willing to get their hands dirty and their feet wet.

The story of how the sportsman in the United States is getting his hands dirty and his feet wet to help his sport is as exciting as hooking a two-pound brookie on a back cast. Just as exciting—and in some areas just as rare.

There is no doubt that the sportsman represents a potential of labor which could, with a little technical supervision, do a tremendous job in the United States every year. Still, comparing the work he does to the work he could do is like comparing a bee to a bulldozer. Why?

Here are my guesses and I'd like to hear yours:

Guess I: The average sportsman doesn't believe he's needed for conservation projects. No one has ever sold him on the idea. He may give his blood to the Red Cross or blunder out of bed at 3 a.m. to watch for 'planes from a tower, all because someone has sold him on the need for such activity. No one has convinced him yet that he can be vitally useful to the conservation of fish and game, in the role of producer as well as consumer.

Guess II: He lacks informed and capable leadership in basic conservation. Youth groups such as the FFA and Boy Scouts are outdistancing the sportsman in "do-it-yourself" conservation projects, because they're set up to do the job. They have trained, dedicated, and often full-time leaders. As far as conservation projects are concerned, the organized sportsmen have never been organized. Naturally, there are many outstanding exceptions.

Guess III: Thousands of sportsmen would be glad to do conservation work if they knew what to do. Hundreds of successful projects bear witness to this. The willingness is there.

Most communities contain areas where natural resources would benefit from the application of unskilled labor. And nowadays many of these communities also contain sportsmen who would apply themselves to conservation projects—*if only they knew exactly what to do.*

Guess IV: The guy, in many instances, simply isn't interested. He joined the club to shoot skeet or to indulge in social activities, not to do something for conservation, so maybe he shouldn't be expected to participate in conservation activity.

If there were a special heaven for hunters and fishermen, the guardian of the gates might classify his applicants as licenseholders, sportsmen, or conservationists. The fellow who refuses to do anything beyond the purchase of a license (and sometimes not even that!) to help his sport is a species who grazes at leisure on the fruit of the other fellow's efforts.

So much for those that *don't.* When you encounter those that *do,* real conservation clubs that live up to the name, their enterprise is an inspiration. And

Words That Can—Sometimes Do—Mean The Same Thing

after you observe enough of these outfits, you begin slowly to bring into focus a composite picture of what it takes to make a good club conservation program. What makes the successful project successful? What do the good clubs have in common? Here are a few inferences drawn from actual observations made in thirty states:

Leadership

Just as a club—any club—is only as good as its leaders, so a club's conservation program is only as good as the man in charge of conservation activities.

Balance

As far as actual benefits to natural resources are concerned, a club's conservation work can be generally divided into two types of activity:

A. *Direct*, in which the members themselves actually do some work to increase the production or availability of soil, water, forests, fish, or wildlife.

B. *Indirect* activity such as legislative or educational activity. However good this may be, it's still of an indirect value to natural resources, since the labor remains to be done.

The best clubs often realize the value of balancing the relatively easy-to-get indirect with the hard-to-get direct activity. For direct activity sharpens interest in the club and insures perpetuity of good leadership. It helps to identify the man with the resource. And it gives a member something to point out and be proud of, say on a drive with his family of a Summer Sunday evening.

Labor for club activities may be hired, but these benefits which accrue from member participation may be neither bought nor sold.

Awareness of Aid

Most successful conservation clubs not only take advantage of available technical assistance; they call in nearby conservation specialists for advice before starting to plan their programs.

Realism

Successful club leaders recognize the presence of what I shall call a consistent core. This is 10 *per cent or less* of the club's membership on whom they can count for actual participation in a direct type of conservation activity.

Does the percentage sound small? The estimate is probably too large! Let me give you just one example: In an annual club meeting, the consistent core (the group you depend on to attend club meetings) voted to raise annual dues from one to three dollars to underwrite a big basic conservation project. Immediately membership plummeted from three thousand to several hundred in spite of frantic canvassing.

Now these members who dropped out didn't suddenly lose their love for conservation; they simply never had it. They weren't solicitous for wildlife; they were solicited for membership!

And it isn't fair to expect a man to turn up, for example, at a tree-planting operation, just because as a local merchant dunned for a dollar, he gave his support to the club. Many of these men are good citizens even if they don't know a double-action reel from a double-barreled beagle.

The successful club program is built around the consistent core. Some idealists try to start a project and involve "every single member in this organization!" Punchy statements, these. But they induce an uneasy feeling that here, by the high priest of drama, on the altar of unreality, is sacrificed the battered old ram of common sense.

Brevity

The most successful programs (direct activity) are those in which the members work a short amount of time—at a time. It's easier to get a man out an hour a week for eight weeks than to get him out for one eight-hour day. Too, successful programs feature at least a few jobs that can be finished in a reasonably short amount of time so that a goal can be reached.

Continuity

Enduring organizations usually have at least one unfinished job on the books. For when the clubhouse is finished—and you have money in the bank, watch out! You've reached the top and may be ready to start down the other side. Nothing keeps up member interest in a club like an unfinished job, unless perhaps it is

Publicity

People love recognition. Project publicity gives the sportsman a sense of pride in and identity with his organization.

Sound Finance

Many projects flop because of financial trouble, but not those which have set sail under a healthy gust of good publicity. Get a sportsman *really* interested in a conservation project, and pass the hat. You'll need an armored car to haul the hat home!

These observations may fit your club no better than an ordinary IQ test measures the mental capacity of a genius. But taken all together, they form a pattern of probability; a pattern you'll be apt to discover in most places where you find fish and game and people who like to get together because of a common interest in these resources.

Chances are darned good you belong to a club or you wouldn't have read this far. Chances are excellent you have a vital interest in our natural resources or you wouldn't be subscribing to the CONSERVATIONIST magazine. Why not analyze your own club's program as far as basic conservation is concerned? It should be easy. At the next club meeting, simply ask a few questions. For example:

How many in our club, during the past year, have gotten our hands dirty or our feet wet to help in some way to increase the production or availability of soil, water, forests, fish or wildlife?

What per cent of our club's total budget is spent on basic conversation work?

How does this compare with the money spent on skeet or social activity?

How many of the projects listed at the end of this article has our club performed during the past year?

How many have I performed?

You may find the answers something to be proud of. Or you may decide that your program could be better balanced. In the latter case, you might want to make out a year 'round conservation plan for your club, and for that reason we've included the suggested activities chart for your club year.

Whatever you do in conservation, and whenever you do it, get in touch with your local conservation technician first.

Conservation jobs are fun to do. And even if they weren't, maybe it's time for more of us as sportsmen to go beyond the license dollar and club membership to help our sport. Time to put something back in. Back into one activity where you can invest the "interest" and get back the principal.

(Continued on page 35)

Pheasants and The 4-H

by Harlan B. Brumsted,
Assistant Professor in Conservation,
Cornell University

As this issue of THE CONSERVATIONIST arrives in your home, 1,450 4-H Club boys and girls from Nyack to Niagara Falls and Plattsburgh to Jamestown, have received allotments of day-old pheasant chicks from the Conservation Department and are busy rearing them for later release on open hunting lands in New York.

In all, just over 63,000 birds were distributed this year for this purpose; a record number. These youthful conservationists are rearing the pheasants on their farms in lots of 35, 70, or 105, and will release them when they are half grown at seven to eight weeks. The Conservation Department pays these co-operators $1 for each high quality bird reared successfully to this age. It's a safe bet that this Summer at least 50,000 of them will be released in suitable coverts across the State.

This is the eleventh consecutive year this same sequence of events has occurred. Since 1947, rural youth enrolled in the 4-H Pheasant Management Project have received 455,500 day-old pheasants. Their "batting average" for rearing success in the 10-year period, 1947-1956, is .723—an outstanding record for this or any league!

In reviewing the history of this project, one finds that it's a story of the egg coming first, before the chick. The activity began long before 1947; it was 1931, in fact, when this co-operative pheasant program got underway. In those days the Department furnished pheasant eggs to 4-H Club members. The procedure involved incubating and hatching the birds, so there was much greater risk of mortality. Rearing success then averaged only 17.7 per cent! But these difficulties apparently did not discourage participation for records show that in both the years 1932 and 1933, 2,300 boys and girls were enrolled; a substantially greater number than have participated since in a single year. It isn't at all uncommon to meet parents of 4-H'ers in the project today, who were themselves taking part 25 years ago, and who speak enthusiastically of their experiences.

Today, this project is conducted in 53 of our 57 non-metropolitan counties. In scope and enrollment it leads among the 4-H conservation projects. Virtually all co-operators entering the project any one year follow it through to completion, and in this respect it ranks well above most 4-H activities in all fields of agriculture and home economics. About two out of three who enroll continue the project for at least a second year.

Individual club members receive 35, 70 or 105 chicks, at the discretion of their Club Agent. This aspect of the project is new, for until 1956, 35 birds was the maximum an individual could receive, but if two members of the same family wished to participate, 70 chicks were furnished. The change was instituted mainly to introduce flexibility so that a co-operator who did especially well in the activity could be rewarded and challenged further by being granted a larger allotment the next year. Recognizing the high desirability of giving as many boys and girls as possible the opportunity to participate, Club Agents have doled out the higher allotments sparingly, and only on merit. In 1956, for example, almost half of the co-operators had units of 35 birds, and only one-fifth were granted the maximum of 105.

As many a sportsmen's club has learned, hand-rearing pheasants is a careful, painstaking process. The only way to avoid heavy, or even complete loss is to have proper equipment and follow management recommendations to the letter. Even then, success is not assured. A power failure, freak change in the weather, or a rat gnawing its way into the brooder house can, and has, caused heavy mortality. The manager must be alert for every possible adverse condition, especially the first few days of brooding.

Those who developed this project wisely set rigid specifications for equipment and training for all who participate. The boys and girls and their parents sign an agreement which calls for providing adequate brooder and yard facilities, using proper feed, and following the best known management. Then, before birds are delivered, the facilities of new co-operators are inspected, and if cases are found where members are not willing to bring them up to par, the birds go to an alternate who does have proper facilities.

Well in advance of delivery of birds, the Club Agent holds a training session for all co-operators—new and experienced—in his county. A set of slides illustrating the procedure is shown. Often a club member gives a demonstration of the brooder setup and there is ample time for questions and discussion. *Attendance is compulsory.* 'Though some of these 4-H'ers may have had long experience in a poultry project, rearing pheasants, they soon learn, is *different.* So all must participate in training activities. Some Agents, with long lists of alternates waiting to join the project, don't hesitate to drop a co-operator who simply neglected to attend this meeting.

A bulletin, prepared by State Conser-

The 4-H Pheasant Rearing Program, as described here by Dr. Harlan B. Brumsted, is one of the most intriguing projects this Department has to offer to budding sportsmen and conservationists. It not only satisfies the inherent desire of every youngster to raise something alive, but it instills in him a sense of responsibility that helps in the development of his character.

A full appreciation of the "wise use" concept of conservation is gained through close association with the pheasants from the time they are day-old baby chicks until they are "weaned" when about half grown and released in natural coverts. Increasing numbers of these co-operators each year are planting food-producing and other beneficial shrubs on the farms to provide better habitat for game. A good many of these boys and girls maintain a constant vigil until the birds are fully matured and harvested by the sportsmen in the Fall.

This elite group of young co-operators experience, in their projects, all of the emotions which are bound to face them as they grow older. Life and death, headaches and heartaches, bitter disappointment, and bubbling elation are all a daily part of a pheasant rearing project.

But some of the greatest benefits of the program are of an intangible nature. How does one measure the value of the intimate contact between these future conservationists and our Game Protectors or between these members, their parents and the sportsmen who visit these projects on the farms? It is possible that this program has done and is doing more to cement relations between the sportsmen and the farmers and his children than any other that we've had to offer thus far.—EARL R. HOLM, *Superintendent of Game Farms*

vation Department and Cornell specialists and an outline of the management techniques are printed aids furnished for study and use in the project.

Rigid specifications for equipment and thorough advance training have paid off. Here's proof: A study of the project for the period 1948-1952. indicated that the rearing success achieved by first year co-operators was *only* 6 percentage points below results attained by experienced participants!

Training materials—slides, bulletins, and the like—are prepared and distributed by the Department of Conservation at Cornell. County orders for birds are assembled there also. But once these are forwarded to Earl Holm, Superintendent of Game Farms, at Albany, he and his assistants throughout the State's game farm system take over.

Actually the co-operative nature of this project extends far beyond the point discussed so far. In addition to the fine work of the Club Agent, there are at least three additional groups participating at the county level, all playing key roles—volunteer community leaders in the 4-H program, sportsmen, and virtually the State's entire force of Game Protectors.

Local leaders in 4-H are on the job to help with organization and training in all project work in which members in their clubs are enrolled. The pheasant project is no exception. Their part extends throughout the activity, from helping select co-operators through liberating the birds.

In recent years, this project has served to bring the organized sportsmen and the 4-H organization in many counties into a close, working relationship which has spelled great accomplishment and advantage to both groups. Sportsmen's federations are participating in various ways. Some sponsor birds over the quantity the State can pay for, others furnish wire for rearing yards, or feed, to get projects off to a proper start.

A truly outstanding example of sportsmen co-operation is taking place in Niagara County. Over the past decade, John L. Stookey, Niagara's 4-H Club Agent, has built Niagara's pheasant project to the largest in the State: 90 boys and girls there received 4,204 chicks in 1956 —and raised 85.1 per cent to liberation! Handling successfully a project of this size obviously demands plenty of organization, but that happens to be one of John's many outstanding abilities. He has developed a system whereby the Niagara County Federation of Sportsmen's Clubs participates and assists to an unusual degree. Member clubs in each township "adopt" the pheasant project members in their respective communities and follow the project of each; visiting them weekly, or even more frequently where help is needed. In addition, they rate each project on a variety of points and eventually select 25-30 top projects for special recognition. Winners receive, among their honors, a special conservation award trip to various State Conservation Department facilities in western New York.

Also over the last few years, Game Protectors have been brought into this activity to an increased degree. Now they help in every county with training meetings, distributing birds, follow-up in assisting co-operators and liberation. They submit a detailed report on each project which is of key importance in helping the boys and girls improve their work and in selecting co-operators the following year. These visits by Protectors, helping rural youth on hundreds of farms, have proved an especially worthwhile use of their time. Their visits potentially can yield benefits years after the individual's project has termintaed.

So it adds up to a large and extensive activity, and one of a co-operative type in the most literal sense. One measure of its accomplishment, the steady and marked increase in rearing success, is shown in the accompanying chart. The 4-H has a motto: "To make the best better." One would be forced to look far to find a more outstanding example of the attainment of this 4-H objective.

But here we are in 1957. In our best pheasant counties, fundamental changes in commercial farming methods, have, over the last 20 years, greatly lowered the carrying capacity for the ring-neck. Stocking, we know, cannot alter these facts. Habitat improvement, where it can be applied, holds some promise. In the light of these conditions, some changes seem called for in this project and in our 4-H wildlife conservation program. Certainly, expansion of the fine start 4-H'ers have made in habitat improvement work would be a place to begin.

But aside from all this, the pheasant project, just as it stands today, seems a nearly ideal starting point for developing the interest of rural youth in wildlife management. Further, as a co-operative venture, bringing groups of varied interest to work together, its value has been proved.

What is

WHAT a stupid question! Why everybody knows that "inch for inch and pound for pound" there's no fish swimming that can touch the smallmouth bass for stamina, courage and cunning. Oh, you'll vote instead for the rainbow trout? And what about the musky? Bah! That's all fresh water stuff—wait 'til you've tied into a 10-pound bluefish! Right away, you see, you've got the makings of a first class hot-stove league fracas; so maybe the question isn't so stupid as it at first seemed. Let's pick it apart a bit and see why.

If, foregoing for the moment the essence of the question itself, we were to take a poll among us from the Northeast, there would be little argument relative to the species acceptable to the charmed circle of "game fish society." Included in the fresh water contingent would be the trout—brook, brown and rainbow; the black bass—smallmouth preferred, Atlantic and/or landlocked salmon, muskalonge, walleyed pike, great northern pike and perhaps a few votes for the pickerel. For salt water the voting range is wider; perhaps not so conclusive, but certainly among those qualifying would be the bluefish, weakfish, striped bass, the tuna tribe, marlin, swordfish and, on the fringe of game fish respectability, the fluke, the flounder and perhaps the pollack.

These then, are the magic names; the elite of the sport fishery of which books without end have been written; on which fortunes have been made in the manufacture of tackle, lures and equipment of wonderous quantity and variation. And on which whole segments of our economy depend to a degree, the magnitude of which is only now being partially realized through recently completed nationwide surveys.

Now, surely through all this, the unanimity of opinion as to which species of all our fishes are to be elevated to the status of game fish, the prestige of the many authors (not neglecting the patron saint, Izaac Walton—even though, presently his halo appears to be somewhat tarnished) who have gained fame in scholarly discourse upon such themes as

* Adapted from a paper presented by the author at the 1957 Conference—Northeastern Section, American Fisheries Society.

a Game Fish?*

the 2x tippit and the No. 16 Hendrickson, the millions of dollars and hours spent each year by sport fishermen in quest of these finned elite—through all this there must run some common thread which, if rightly grasped, will unravel the question: What is a game fish?

There is such a common thread, it seems to me, and the nature of it, I believe, is *challenge*. These are the species which modern man, freed from the necessity of fishing solely for food, has found to offer the greatest challenge to his ability, his ingenuity and his imagination as an angler. Moreover, to further strengthen this concept, there's a marked trend toward the development and use of more fragile rods, more delicate lures, lighter lines, ever purer techniques, and a more rigid core of angling ethics, all designed, it appears, to further enhance the challenge. One may hope, I suppose, that this will not be carried to the ultimate in angling refinement—taking no fish at all!

Well now, if we accept this concept of "challenge" as motivating our selection of the named species to be enthroned as game fish, have we wrapped the matter up? I think not. We're in difficulty, it seems to me, not in our definition but in our unquestioning acceptance of the species which tradition ordains shall carry the game fish banner.

Let me illustrate. Let's go back a few years—quite a few for some of us—to a sunny day in July, digging in the good black earth of the garden, transferring fat, pink angleworms to an empty tobacco can, trotting along the path through the woods, crawling up to the creek bank by the big pool to peer through the trailing tree roots back under the bank where glittering in the sun's rays, slowly finning, lies a "punkin' seed as big as your two hands." A challenge? Well, you bet it was. Or how about a warm night in April, a gunny sack hitched over your shoulder, a lantern in one hand, a spear in the other while the rushing Spring waters of the stream distort the lantern's gleam, lay weird shadows over the stream bed while common suckers streak by, elusive as gray ghosts. A challenge? I hear no denials. Or let's work the boat slowly now to get the landmarks lined up so that looking down through thirty feet of clear lake water you can make out the broken crib-work remnants of a one-time pier, and there, idling among the algae-velveted timbers, are yellow perch, jack perch—the biggest in the whole lake. A challenge? You can be sure of that, especially if you are twelve years old.

Just one more. Put yourself some Spring in the marshy back-waters of a lake, put a bow in your hand and nock an arrow mounted with a fishing head. See that swirl by the rushes' edge? Watch that big dorsal just cutting the water's surface. Now work up in range. Take it easy! One quick move, one heavy foot-fall and you'll spook that carp—one of the wariest and smartest fish alive. A challenge? You just ask any bow hunter.

And, so, if time permitted, we could go on and on, but you see where we're getting.

So, what are we to do? Shall we add to our game fish aristocracy these new candidates—the "punkin' seed," the common sucker, the yellow perch and the carp? No, there's a better solution, I think. Let's retain "challenge" as our criterion; but let's realize that we are dealing here not only with fish but with time—and place—and circumstances, and, most of all, with humans—far more difficult to catalogue than any fish.

Perhaps we can wrap it up by saying, with apologies to Gertrude Stein, that a game fish is a fish, is a fish, is a fish.

—A. W. Bromley

'Coons vs Cows

FOR some years now, raccoons in New York have "never had it so good." They've waxed abundant and fat on all sorts of 'coon goodies; frequently at the farmers' expense. Their depredations in a field of corn in the milk stage has often been described by naturalists and even more often, but in much more lurid terms, by dairy farmers who like to think they are raising corn for cows; not 'coons. On the other hand, 'coon hunters and their hounds rate these nocturnal raiders as the number one game animal.

So—reasoned the Department's game management men of the Allegany District—why not take the raccoon crop damage complaints of dairy farmers, add X number of 'coon hunters and hounds. This proved to be a pretty efficient formula when applied last year in Cattaraugus County. Here's the answer as reported by Howard Bobseine, assistant game manager in that area:

"The raccoon population was especially high in certain sections of Cattaraugus County during 1956 and many farmers in an area around the Township of Otto complained about damage to corn and other crops.

"A local sportsman, Henry Kreideman, of Otto, and his two sons, Richard and Lee, hunting with three dogs during the open season were very helpful in effecting a control measure. In the course of their hunting activities they answered several requests to hunt by neighboring farmers.

"A local dairy farmer, Stanley Marek, of Cattaraugus, asked them to hunt his cornfield and adjoining areas. In response, Mr. Kreideman hunted the farm several nights for a take of 28 'coon. Another complaint which we referred to them put 12 raccoon on the stretching boards. This request-hunting combined with their 'just for fun' hunting accounted for 194 animals taken during the 1956 open season within an approximate 7 mile radius of the Village of Otto.

"The efforts of these sportsmen were greatly appreciated by area farmers. By reducing the high raccoon population they accomplished a step in the direction of biological balance that will benefit all wildlife—the raccoon included.

"179 pelts were sent to one fur buying house for a return of $210.65. Mr. Kreideman felt that while this amount would pay the annual feed bill for his three dogs, it's evident that even the most successful 'coon hunters today need another occupation."

Finger Lakes Rainbows —Part III

A Chronicle of Their Progress— from Egg to Adult

by Wilbur L. Hartman,
Research Assistant, Cornell University

BETWEEN a newly hatched trout fry, barely an inch long, and a smashing 8-pound rainbow on the end of your fish line, lies a fascinating life story. Richard Hatch (THE CONSERVATIONIST, February-March, 1957) described spawning and growth of eggs up to hatching. In March, when most rainbows spawn their eggs (1) water temperatures are frigid, commonly around 40° F. Egg development is slow. But as Spring progresses, water temperatures go up and the tiny rainbows inside the eggs grow faster. Most fry hatch out in late May or early June. At an average temperature of 50° F, hatching takes about 30 days.

After hatching, fry carry yellow-orange yolk sacs attached to their bellies (2). At this stage they are still buried in the gravel of the spawning bed. When this rich reserve of food is used up, these young rainbows move up through the gravel to the open water above. They are now advanced fry. They begin to feed on minute particles of food carried along in the water, and grow rapidly into "fingerlings" or parr. In December, after their first growing season, these parr may be 3 or 4 inches long (3). Parr markings, dusky vertical bands on their sides, are characteristic of most young trout and salmon. Some rainbows live another year or more in the streams. Two-year-olds (4) may be 5 to 7 inches long in December. Young rainbows migrate to the lakes in the Spring. Some downstream movement of fry towards the lakes occurs, particularly in Seneca. One- and 2-year old parr also go down to the lakes. Larger migrants, like 8- or 9-inch 3-year olds (5) develop a silvery coat and are called "smolts."

Juvenile lake rainbows are as shiny as a new silver dollar. Many are caught by fishermen, who often refer to them as "steelheads." Technically speaking, "steelheads" are rainbow trout that spend part of their lives in salt water, and spawn in fresh water. In the Finger Lakes we are substituting a large freshwater lake for the ocean, but the pattern is similar.

Some mature lake rainbows run into the streams in late Fall. Others, may enter on a January or February thaw freshet. But the big spawning migration occurs in March. After rainbows enter the streams their coloration changes. Recent arrivals, called fresh-run fish, are still silvery. But the longer a fish remains in the stream, or the closer the fish is to spawning, the more it loses its silvery coat. Black spots begin to show up clearly. The pink or reddish stripe commonly associated with rainbows develops. The male pictured (6) has the typical hooked jaw and slab-sided appearance that "buck" trout get when mature. Sooty black throats and bright red stripes may occur on bucks that have been in the streams for some time. Females (7) have no hooked jaw, are round-bodied, and usually more silvery. All specimens used for the illustrations came from Cold Brook, the inlet to Keuka Lake. After spawning, the trout are sorry looking specimens, lusterless and gaunt. The tail of the female is worn and broken from redd building; both sexes may be bruised. So don't expect all rainbows to look as pretty as those pictured here.

This article on the life history of rainbow trout in the Finger Lakes area is the third in our series. The first reported on the spawning habits of this species; the second on the tagging studies, with general suggestions as to future management. In the August-September issue we shall present a brief review of the important aspects of this valuable rainbow fishery inclusive of specific management recommendations.

Rainbows Show Their Age

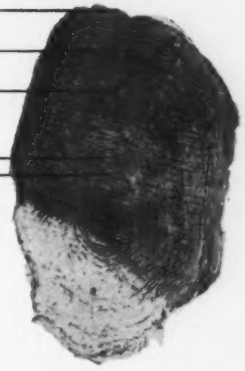
For $64,000 how old is that rainbow? Aging a rainbow trout doesn't rate such a reward, but to the fishery biologist age and growth statistics are invaluable. Fortunately a rainbow trout's scales tell its life story. Starting as a tiny plate, the scale grows as the fish grows. Microscopic ridges are laid down around the center. Many are added each year. When the fish is growing well in Spring and Summer these ridges are spaced wide apart. But during slow growing Winter periods the spacing is narrow. So a rainbow's age can be determined by counting the Winter bands of closely spaced ridges. Also, since stream growth is usually slower than lake growth, a scale shows when the fish migrated to the lake. Finally, when a rainbow spawns there are processes of reabsorption that actually erode the margins of the scales; interrupting the pattern of circular ridges. This erosion leaves a mark that can be detected in later years, even though new growth is laid down on the scale. The number of previous spawnings is obtained by counting these "spawning" marks. Scales from typical female rainbows in three Finger Lakes tributaries illustrate their use in discovering the life story of a fish. Total lengths figures given are averages for fish with the same life story. Harold Lyon of Cornell University provided the scale pictures.

In the preceding articles of this series the general picture of life for Finger Lakes rainbows has been presented. But beyond that, variation is the keynote. This

This female rainbow spent two years in the stream before moving to the lake. Note accelerated growth rate after leaving stream. She spawned for the first time at age five; see indication of spawning mark at margin of scale.

YEARS OF AGE	TOTAL LENGTH
V	20.6
IV	16.7
III	11.1
II	6.1
I	3.4

COLD BROOK RAINBOW
(Keuka Lake)



Again, two stream years and three lake years before spawning. Note spawning erosion on scale's margin.

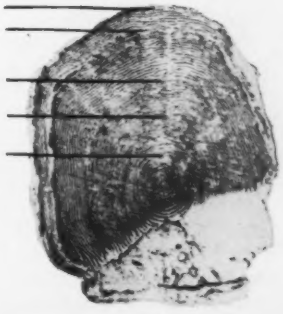
V	18.9
IV	15.5
III	11.0
II	5.8
I	3.0

GROUT BROOK RAINBOW
(Skaneateles Lake)

Only one early year of slow growing, then three rapidly growing lake years before she spawned for the first time at age four. She also spawned the next year. Note the 4th and 5th year "spawning" marks as indicated by interrupted pattern of scale ridges or circuli.

V	25.1
IV	21.2
III	13.6
II	9.1
I	4.0

CATHARINE CREEK RAINBOW
(Seneca Lake)



Enlarged photo-micragraphs of rainbow trout scales tell the story of their lives.

shows up when we look at the various phases of their life stories.

First—Grout Brook, Catherine Creek, Cold Brook, Naples Creek, and several smaller tributaries are natural fish hatcheries. The eggs are laid and incubated there. But life isn't the soft touch as in a man-made hatchery. The young rainbows aren't spoon-fed nice rich liver and meal. They have to forage for themselves. Stream life is hard, hazardous and oftimes very short. Natural enemies of the small rainbows—like kingfishers and big brown trout—are ever present. Then too, there are many physical dangers such as extravagantly high Spring water that may be so wasted by Summer's end that some young rainbows become stranded in pools and backwaters. Often, in such stagnant situations, water temperatures exceed those at which trout can live. And in these confined locations natural predators have a picnic. High water temperatures in the stream caused by too much shallow water and inadequate shade from bank vegetation impose serious physical limitations on streams like Catherine.

The tributaries are nurseries for one to three years. This is the second phase. Grout and Cold brooks carry tremendous numbers of parr the year around. Many are two or three years old (Figure 1). Early slow growth shown on adult rainbow scales likely represents such early stream life. Most adults from these two streams show at least one stream year, and many show two or three. On the other hand, relatively few parr are carried in Catherine Creek. They are limited to cooler upstream waters, and cold-running tributaries such as Deckertown Creek. As water temperatures go up rapidly in June, large fry movements head toward the lake after the hatch. This suggests that most rainbows produced enter Seneca Lake at a very early age. The first year of slow growth for many adults probably represents lake life. Further research is planned on this point.

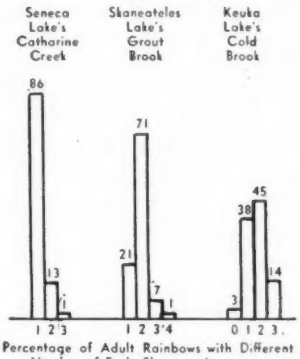
The third phase in the life of the rainbow is a period of rich feeding and comparatively rapid growth in the lakes. Lake life until first spawning varies from one to three years. It varies with the sex, feeding conditions, and perhaps less obvious factors such as inheritance and climate. One generally consistent rule is that males mature ahead of females. For example, 85 per cent of the newly mature males that run up Catherine Creek for the first time are three years old. Females, however, usually take at least four years to mature, and some take five or six. Both sexes take longer on the average to mature in Skaneateles and Keuka lakes. Why? Stream life seems to be the answer. In all three streams, rainbows with only one year (or none) of stream life mature earlier than those with two years. And those with two years mature earlier than rainbows with three or four. Since a larger proportion of fish in Skaneateles and Keuka lakes have more than one year of stream life, fish take longer on the average to mature. The net effect of all this is to spread the maturing of rainbows over several age groups. Note that any one hatch migrates to the lake and returns to spawn over a period of several years—Nature's insurance, perhaps, that "all the eggs are not in one basket."

Growth of Finger Lakes rainbows is often spectacular and often compares favorably with steelhead growth in the sea. The State rainbow trout record is 21 pounds, taken 1946, in Keuka Lake. Our Spring electrical inventory has turned up a 16.5 pounder, and several in the 14- and 15-pound category—all from Catherine Creek. Table 1 shows average lengths for fish of different ages. In any one age group growth is variable. It depends on how much early slow-growing life a fish has had, when it matures, and just normal variation in growth of fish with the same life story. After their fourth year, growth of Keuka and Skaneateles Lakes rainbows slows down markedly, while good growth continues into the older age groups of Seneca Lake fish. The hordes of sawbellies (alewives) in Seneca Lake keep large rainbows growing rapidly. This important food fish is also present in Keuka, but in years covered by some of our sample, sawbellies existed in much reduced numbers here. Competition with a dense lake trout population may also be keener in Keuka Lake, and the longer stream life has already been noted.

Scale studies supplemented by tag returns clearly show that the spawning runs are dominated by first year spawners. Figure 2 gives the per cent of males and females taken in the spawning run samples that were spawning for the first, second, or in one case the fifth time. Roughly 70 per cent of all rainbows in the runs were spawning for the first time. Most of the remaining males are second spawners, with few coming back for the third time. More females are repeat spawners, and there are more three-year spawners among them. These data show two facts. First, a significant portion of the runs is made up of rainbows that have spawned before. When growing conditions are satisfactory these repeat spawners make up the large "prize" specimens. A Catherine Creek female (Tag Number 1A285) weighed 7.9 pounds before spawning in 1955. The same fish weighed 10.6 pounds before spawning in 1956, a gain of 2.7 pounds.

(*Continued on page 34*)

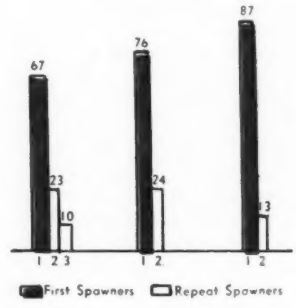
FIGURE 1



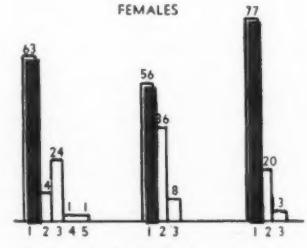
Percentage of Adult Rainbows with Different Number of Early Slow-growing years.

Fig. 1 Example. 71% of Skaneateles Lake fish spent their first two years in Grout Brook.

FIGURE 2 — MALES



FEMALES



Percentage of Adult Rainbows Spawning for First or More Times

Fig 2 Example: 67% of spawning male rainbows in Catharine Creek are there for the first time.

TABLE 1

Years	Catharine Creek	Grout Brook	Cold Brook
VII	28.7		22.7
VI	28.1	20.2	22.0
V	23.9	19.4	20.7
IV	19.9	17.5	18.6
III	13.6	14.2	14.8
II	8.5	5.8	6.1
I	4.0	3.0	3.4

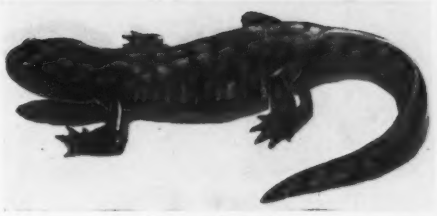
Average Length of Rainbows in Inches

Table 1. Example: Four-year old Rainbows in Cold Brook average 18.6 inches long.

Salamanders and Lizards of New York

by Dr. Edgar M. Reilly, Jr.,*

Curator of Zoology, N. Y. S. Museum



Tiger salamander

"ONE day when I was about five years old, my father was sitting in a ground-floor room of ours in which washing had been going on, and where a large fire of oak logs had been left. Giovanni, his viola on his arm, was playing and singing by himself near the fire —for it was very cold. Looking into the fire he chanced to see in the middle of the most ardent flames a little creature like a lizard disporting itself in the midst of the intense heat. Suddenly aware of what it was, he called my sister and me and pointed it out to us children. Then he gave me a sound box on the ears, which made me cry bitterly, on which he soothed me with kind words, saying, 'My dear little fellow, I did not hurt you for any harm you had done, but only that you might remember that the lizard in the fire there is a salamander, which never has been seen for a certainty by any one before. Then he kissed me and gave me some farthings.' "**

Boxing one's ears is a rather rough way of introducing one to a salamander, even when soothed with farthings.

Salamanders are *not* born of fires and are *not* lizards. Salamanders are amphibians, as dependent on water as are frogs and toads. Lizards are reptiles hatched from eggs or born alive, often remote from water. Lizards are scaled and bear claws on their toes, while salamanders are smooth-skinned and have no claws on their toes. New York State has seventeen species of salamanders but only three species of lizards within its borders. Several of the salamanders are very common throughout the State while our lizards are only locally common and restricted to the southern parts. All salamanders in New York have gilled larval stages like the tadpoles of our frogs and toads.

Most of our salamanders are nocturnal, spending the day under rocks, logs and leaves. The land salamanders and some of the aquatic species hibernate. As far as I know there are no salamanders anywhere with poison lethal or harmful to humans.

Biologists used to believe that salamanders neither barked nor bit. They all have some form of teeth and it is now known that several species do bite although their small size precludes any serious wounds. Several naturalists have reported "barking" salamanders. True, the noises recorded are not much more than squeaks and grunts, and for the Common Newt, the "bark" is hardly more than an occasional low chirping noise.

On an economic basis, the salamander's greatest contribution on the plus side is in the role of insect eaters. They really do no one any harm, although fishermen, attempting to separate Waterdogs (mudpuppies)—one of the larger and less prepossessing members of the tribe—from baited hooks, have never looked with favor on the creatures.

On the other hand, doctors and premedical students regard the species as a friend. They make fine specimens and are widely used in the study of comparative anatomy. Salamanders and lizards alike make very interesting pets and appear to enjoy life when held in an approximation of their natural habitat in terraria, aquaria or screened boxes.

Salamanders are generally slow-moving, but capable of quick starts to avoid capture. They are, except for the Eft, rather moist and slimy and are never found in warm, sun-baked spots. New York's native lizards, on the contrary, are generally fast-moving and difficult to capture. Their skin is never slimy and they may be found in warm, dry places.

Our lizards are all capable of "dropping" their tails when about to be captured. This is a protective device as the predator which seizes the lizard by the tail gets just that—not the lizard. Since the lizard can grow a new tail on the stump of the old, he is quite willing to exchange his extremity for his life. The trick is in the tail vertebrae which have weak centers that part readily when grabbed; the lizard cannot detach his tail at will.

Lizards

NORTHERN FENCE LIZARD (*Sceloporus undulatus hyacinthinus*): 7½-8 inches. The tail is a little longer than the head and body. They prefer fairly dry open woods with brush piles which furnish cover. They seem to frequent pine more than deciduous forests. They hibernate from November till late March in burrows, rotting logs and rock cracks. Sometime from May to August they lay from 4-17 eggs just below the surface of the soil with hatching taking place about 8-10 weeks later, depending

on warmth and moisture conditions. Food is mainly insects. They climb trees readily and will circle a tree, much as a squirrel, keeping it between them and their enemies.

FIVE-LINED SKINK (*Eumeces fasciatus*): 5-6 inches. (Young with blue tail pictured with adult.) The tail is nearly equal in length to head and body. Smooth, even scales give the skinks a glossy appearance. Both our native skinks prefer a more moist habitat than the Fence Lizard and may be found in the wooded areas, generally on the ground, under stones and logs. They will sun themselves for brief periods during the warmer days. When captured they will bite but the teeth seldom can puncture the skin. Two-18 eggs are laid from late May to mid-July in rotten logs and loose soil often several inches below the surface. The mother guards the eggs during the incubation period of some 27 to 56 days. The mother, perhaps tiring of the vigil, will occasionally eat one of her own eggs. Food is mainly insects

(*Continued on page 26*)

** From: *The Memoirs of Benvenuto Cellini* translated into English by Anne MacDonell—*Everyman's Library*, #51, 1907, pages 7-8.

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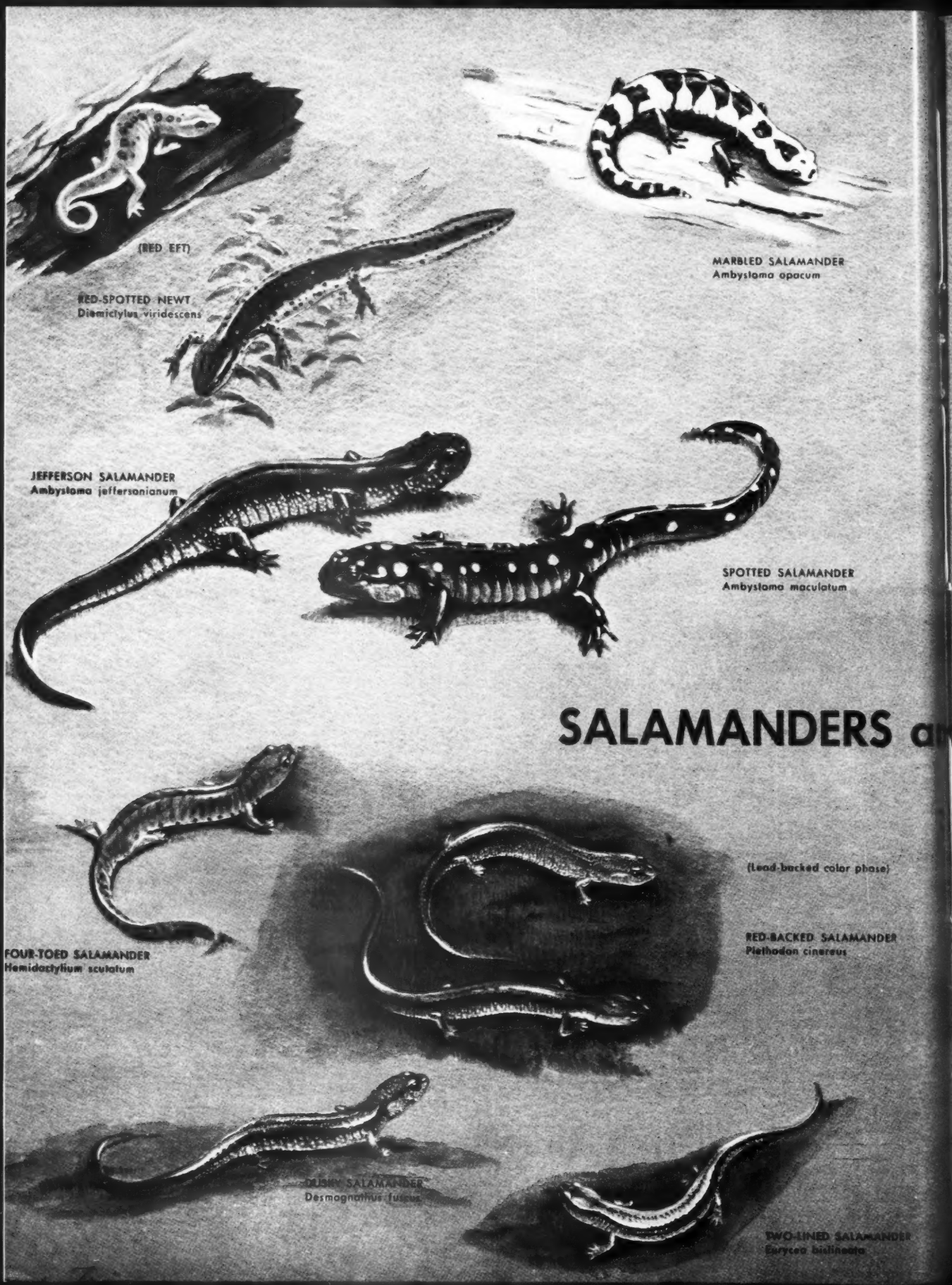
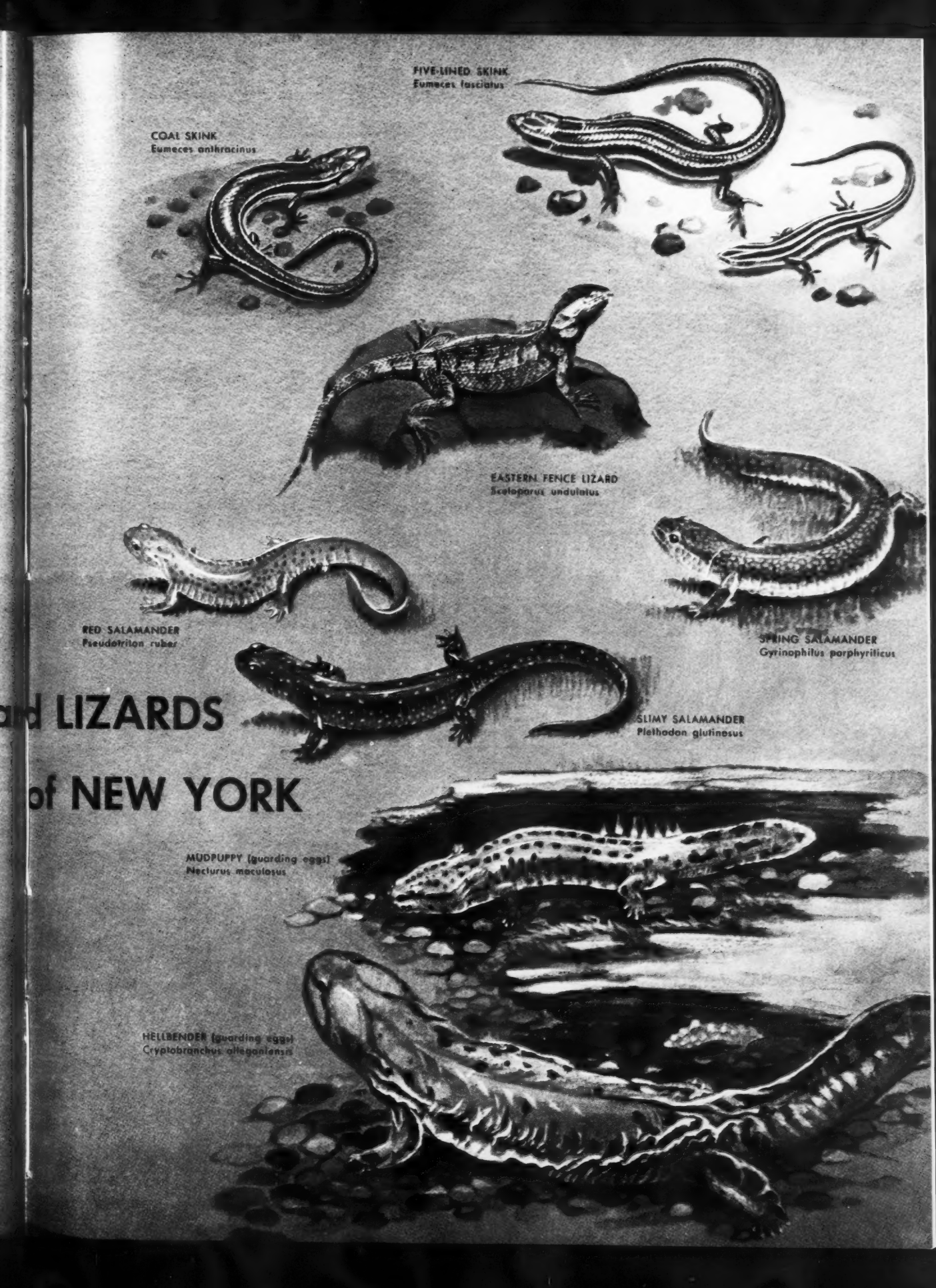

(RED EFT)
RED-SPOTTED NEWT
Diemictylus viridescens
MARBLED SALAMANDER
Ambystoma opacum
JEFFERSON SALAMANDER
Ambystoma jeffersonianum
SPOTTED SALAMANDER
Ambystoma maculatum
SALAMANDERS a
(Lead-backed color phase)
FOUR-TOED SALAMANDER
Hemidactylium scutatum
RED-BACKED SALAMANDER
Plethodon cinereus
DUSKY SALAMANDER
Desmognathus fuscus
TWO-LINED SALAMANDER
Eurycea bislineata


FIVE-LINED SKINK
Eumeces fasciatus
COAL SKINK
Eumeces anthracinus
EASTERN FENCE LIZARD
Sceloporus undulatus
RED SALAMANDER
Pseudotriton ruber
SPRING SALAMANDER
Gyrinophilus porphyriticus
SLIMY SALAMANDER
Plethodon glutinosus
ard LIZARDS
of NEW YORK
MUDPUPPY (guarding eggs)
Necturus maculosus
HELLBENDER (guarding eggs)
Cryptobranchus alleganiensis

(Continued from page 23)

but sometimes smaller lizards and mice are taken. These lizards hibernate, but little is known of the dates and places in New York.

COAL SKINK (*Eumeces anthracinus*): 5½-8 inches. The tail is about twice the length of the head plus body. Prefers same habitat as the Five-lined Skink, but is found only in central western part of our State. These skinks are known to enter water readily while attempting to escape. So far as is known

they eat only insects and larva. Eggs are laid in May, taking about 4-5 weeks to hatch. They must hibernate but little is known concerning dates or places preferred.

Salamanders

MUDPUPPY (*Necturus maculosus*): 10-15 inches. They mate in the Fall and

eggs are found from May to June, hatching in late July and August. Each nest consists of from 40-130 eggs attached to the underside of some smooth log or rock, or even to sheets of tin, canvas and other debris, in 3-5 feet of water, usually more than fifty feet from lake shores but anywhere in stream pools. The Waterdog, as it is sometimes called, is found in both running and still water. It is active all year round, and looks just as unlovely Winter and Summer. It takes an active interest in baited hooks, even in the wintertime—much to the annoyance of the ice-fishermen. It usually walks along the bottom of a creek or pond, but can swim fairly fast if frightened. The reddish bushy gills move constantly in still warm water and are quiet in cold well-aerated waters. The gills are *not* "poison stingers" as folk lore would have us believe. Their food consists of earthworms, insect larvae, leeches, crayfish and occasionally small minnows, particularly sculpins.

HELLBENDER (*Cryptobranchus alleganiensis*): 15-27 inches. Our largest salamander; only the Amphiuma of the southeastern United States and the giant salamander of China and Japan are bigger. It is not known to leave the water and seems to prefer running water. It has well developed lungs and absorbs oxygen through these, its gills and its skin, the folds and wrinkles of which give added surface for this task. In this species the male apparently builds the nests under large rocks and then guards the eggs till they hatch. The eggs may be laid any time from August into early September and might not hatch till mid-November. At hatching the larvae are about 1¼" long with external gills. The gills are not lost till the larva is about 18 months old and about 4-5½" long.

Hellbenders are active throughout the year; they eat almost anything of animal nature from insects, crayfish, worms, small fish to refuse. They are mainly nocturnal although they may sometimes be seen walking on the stream beds in broad daylight.

NEWT, RED EFT (*Diemictylus viridescens*): 3-4 inches long. The Red Eft, the younger land form of the Newt, may be 2-3½ inches long. Probably the best known of all our salamanders. Nearly every pond and lake in the State will have multitudes of the aquatic form during Spring and Fall months and every moist woodland disports the bright red-orange Eft from late Spring to Fall. On Long Island the Eft is reddish brown

color. The Red Eft with his bright yellow eyes is mistaken for a lizard and, because of his attractive appearance, brought home as "pets" by children. They may be kept in terraria and fed on insects, worms, etc. The Newt may be kept in aquaria where they will live on brine shrimp and those forms of animal life usually least desired in an aquarium. In the wild, a pond filled with Newts is not going to breed too many mosquitoes; besides the larval forms of this pest they also eat other aquatic insect larvae, worms, amphibian eggs, molluscs and fresh water crustaceans. The eggs are laid in the Spring from April through May, depending on the latitude. In very warm weather the eggs may hatch in as few as 10 days, but generally hatch in from 20-35 days. The young may remain in the gilled larval form for about 80 days and then transform to the Eft stage and begin their land life which may last as long as three years and during which they may be found at varying altitudes and habitats. When Efts reach sexual maturity they return to the ponds and transform into Newts with keeled swimming tails and smooth skins. The Newt retains the lungs of the land form, but the change in the skin and lining of the mouth enables the creature to absorb oxygen through these organs as well as gulping air into the lungs. The Newts remain active in the free water throughout the year; the Efts hibernate under mold, rocks or in rock cracks.

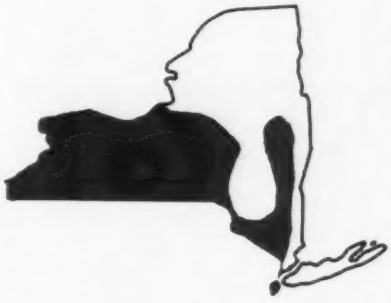
FOUR-TOED SALAMANDER *(Hemidactylium scutatum)*: 2-2¾ inches. Often found in boggy swamps where it builds its nest in the wet mosses overhanging the water. The eggs are laid sometime in April and hatch in about one month when the larvae wiggle through the moss and drop into the water. The larval period may last 6 weeks. The legs are tiny and escape movements are violent snaps and wiggles which throw them almost full length. Like the lizards these salamanders lose their tails as a defense mechanism, but, unlike the lizards, the loss is sometimes voluntary, the tail remaining on the spot and wiggling violently while its owner quietly crawls out of harm's way. The adults are accomplished swimmers but wander after the

breeding season into adjacent woods burrowing under rocks, logs and leaves. They hibernate in similar places often being found 6 inches below the surface. Food is mainly worms and insects; the larvae undoubtedly taking the abundant aquatic larvae of insects.

RED-BACKED SALAMANDER *(Plethodon cinereus)*: 2-3½ inches. They come in two color phases—red and grey. The grey phase was formerly thought to be a different species named the Lead-backed Salamanders. This species is the one found most often under the logs and rocks of damp woodlands of preferably mixed or pure deciduous trees. Eggs are laid over a wide period possibly beginning in June in this State. They are laid under damp rotten logs or in mossy loamy earth and hatch without benefit of parental care. Although the

larvae have gills when they hatch, these are lost in a few days and no water is necessary for their development. This amphibian can swim, but apparently never enters the water voluntarily. It can throw off its tail like the Four-toed Salamander, as an aid to escape. It is most active at night when it searches for its favorite food, mainly small land insects and their larval forms. It hibernates underground.

SLIMY SALAMANDER *(Plethodon glutinosus)*: 4¼ to 7⅜ inches. This salamander is not uncommon but very little



is known of its life history. It apparently lays its eggs in caves and hollows in rocks. Laying is not the proper word as the egg masses found have been suspended from perpendicular walls. Development is probably similar to that of the Red-backed Salamander. Food is primarily insects such as the Sowbug, ants, beetles and centipedes. It apparently requires moister woodlands than the Red-backed Salamanders and retires to a Summer sleep quickly during drought periods, digging deeper underground.

WEHRLE'S SALAMANDER *(Plethodon wehrlei)*: (Not pictured.) 3-6 inches.

Similar to the Slimy but of more slender form and darker appearance since the white spots are limited more to the sides. Little is known of its life history. Food consists mainly of insects.

SPRING SALAMANDER *(Gyrinophilus porphyriticus)*: 5-7¾ inches. Sometimes known as the Purple Salamander.

As the common name here used indicates, they are frequently found in or near springs or small streams. The adults are considerably aquatic but will often be found under large rocks and logs in cool damp places. Reproduction is by eggs although it is possible that the eggs hatch in the female and the young are live-born. Very few egg masses have been found outside the female although numerous gravid females have been reported in Fall, Winter and Spring. Young larvae have been collected in April and July and they may not transfer to adults for 3 years. They are seldom found in the open during daylight hours. They are carnivorous and often eat other Spring Salamanders and frequently take other species of salamanders. Insects, however, probably form the bulk of their food. They spend the Winter and periods of low water or drought completely submerged in springs or running water.

RED SALAMANDER *(Pseudotriton ruber)*: 2¾-6 inches. This species is widespread but only locally common. The

recently transformed adult is a bright coral red which darkens with each shedding of the skin. Eggs are apparently laid in the Fall in New York State under logs and stones at the margins of cold springs and swamps, taking from 58-74 days to hatch. The larval period may extend to 3 years. They are found in greatest numbers in cold springs and streams and are active through the Winter. They are seldom found far from water and prefer to escape by swimming in this medium. They feed on aquatic insects, other salamanders and worms.

TWO-LINED SALAMANDER *(Eurycea bislineata)*: 2-4 inches. They are the smallest of our aquatic salamanders. Their color is variable ranging from orange-yellow and yellow to straw yellow on the back. They may be found at almost any time of the year under stones at the margin of cold streams in the

water. In Winter they are found beneath the rocks in the deeper parts of flowing streams. They have been recorded as hibernating under rocks and logs near small streams. There are few records of their occurrence far from water. The egg laying season is variable, but the nests are always placed under a rock or other support in running water. The larval period extends at least to the Summer following the Summer of hatching and may extend in some individuals to a third Summer. Food is primarily insects and their aquatic larval forms such as stonefly and mayfly nymphs.

MOUNTAIN SALAMADER *(Desmognathus ochrophaeus)*: (Not pictured). 1¾-3¾ inches. The Mountain Salamander is so similar to the Dusky that it takes an expert to distinguish between the two in the field. The Mountain Salamander is more terrestrial; the tail is rounder without a keel in cross section; the dorsal bands have straighter edges; the belly is uniformly pigmented; the sides bordering the dorsal band are darker than the more mottled sides of the Dusky; and the body is generally more slender. Mating takes place in both Spring and Fall. The female guards the eggs in the nest much as does the Dusky

but the young larvae do not have an aquatic life since they lose their gills in a few days and remain on land most of their life. The eggs may hatch in Fall or Spring. With the approach of Winter they congregate near streams and springs and hide in water saturated ground beneath logs, moss, and rocks where they pass the colder months. They are nocturnal like most salamanders and eat mainly insects. All in all, the salamanders of New York have excellent eating habits.

LONG-TAILED SALAMANDER *(Eurycea longicauda)*: (Not pictured.) 3-6 inches. This is one of the rarer salamanders of the State. It is similar to the Two-lined Salamander in habits and habitat. It differs in having a tail longer than its body and being a yellow color with minute dark colored flecks throughout the ground color. Little is known of its life history in New York State; it is presumed to parallel that of the Two-

lined but more adapted to the land environment. The adults have been recorded only from terrestrial habitats during the non-breeding seasons. Food consists mainly of centipedes, spiders, mites and insects generally found under stones on land.

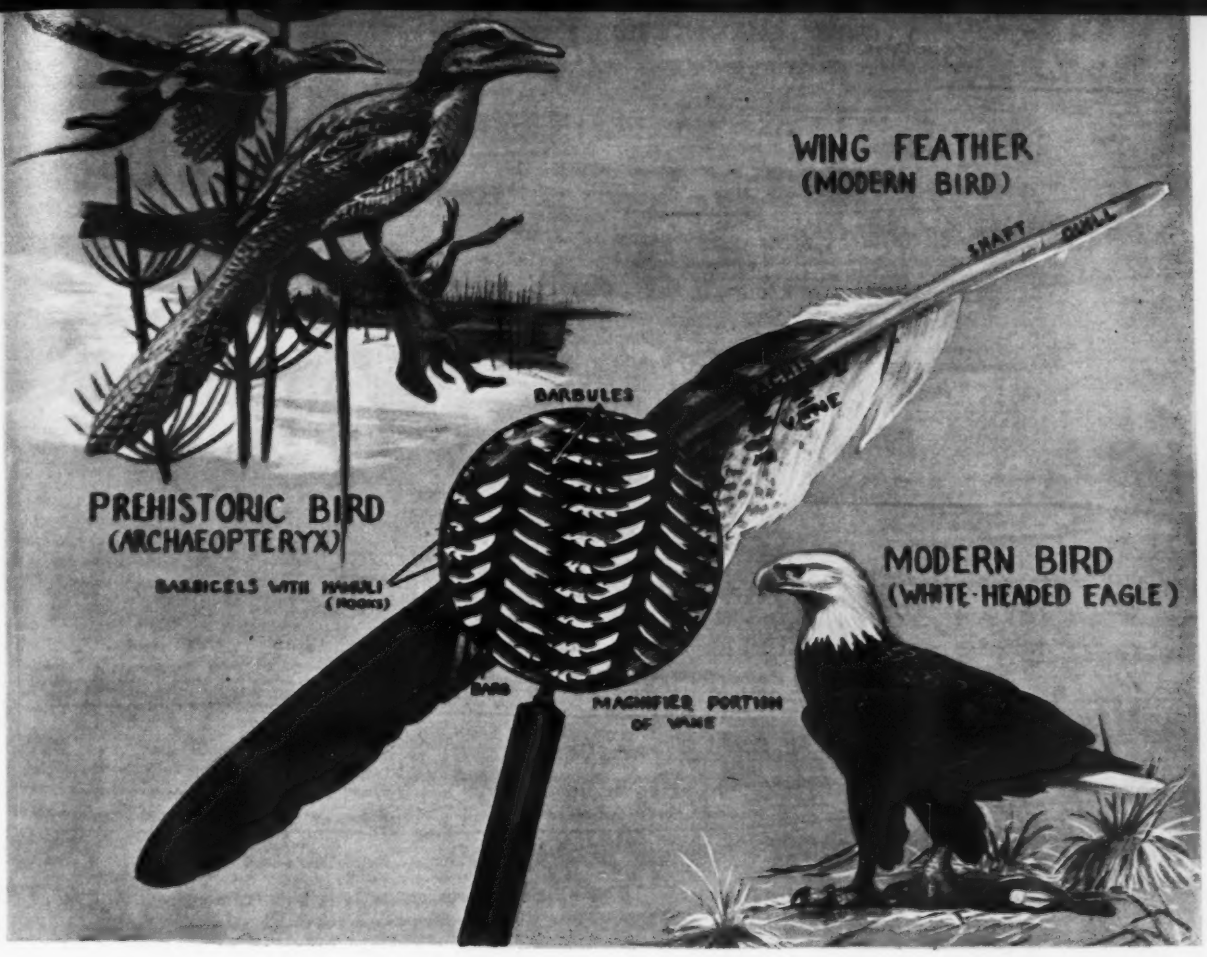
DUSKY SALAMANDER *(Desmognathus fuscus)*: 2½-4½ inches. Along the edges of our woodland streams the Dusky is one of our more common salamanders. These salamanders excavate nests under rotten logs and rocks near a stream or spring and some 20-40 eggs are laid in June or July. The mother remains with these eggs till they hatch and often guards the young through their first few days. Generally the eggs hatch in from 5 to 8 weeks. The larvae are fully aquatic and must make their way to water in which they live through Fall, Winter and Spring some 8-10 months before transforming into adults. Like most salamanders the Dusky is nocturnal and at night may be found crawling on the sides of stones, logs and on low plants. By day they hide under debris, rocks and logs always near water. Insects make up

the bulk of their food, supplemented by worms, spiders and occasionally another Dusky Salamander. The larvae eat nymphs of aquatic insects. Even in Winter the adults may be found under rocks and logs and in deep crevices of shale banks although the colder the weather the deeper they burrow.

JEFFERSON'S SALAMANDER *(Ambystoma jeffersonianum)*: 5½-7¼ inches, These large salamanders may be more common than records indicate. Nocturnal by habit and more solitary than the Spotted Salamander, they may be seen locally in great numbers during the breeding season. They start congregating at the breeding lakes and ponds in late March or early April, often before the waters are completely ice-free. They often perform a nuptial dance with several individuals participating—sort of a pasture-pond square-dance. Since this takes place mainly at night, an observer needs warm clothes, stout boots and a good flashlight (some insist a weak head is also necessary). The dance reminds me of the Mock Turtle's lines from *Alice's Adventures in Wonderland* where he describes his class on "reeling and writhing. . . ."

Eggs are loosely fastened to stems of aquatic plants or water-logged twigs. After laying, which generally takes place a few days after breeding, the gelatinous envelopes of the eggs swell with water and form a large mass completely enclosing the supports. One female may lay 300 or more eggs which take from

(Continued on page 35)



Feather Structure*

"FEATHERS make the bird" is an old saying that is scientifically accurate. Any creature with a body covered by feathers *must* be a bird but let's take a closer look. Feathers are unique. They represent one of the finest works of design and engineering that Nature has produced.

There is a lot of evidence that birds originated from reptiles. During the Age of Reptiles there was a group of animals called "bird-footed dinosaurs." They ran about on their hind legs which resembled the legs of modern ostriches, and some of them were no larger than our chickens. It is supposed that birds are descended from this group of reptiles and that, as they became able to fly, their scales gradually changed to feathers. It is not easy to see how a scale could become a light flexible web but the theory is that natural selection, after millions of years, produced the miracle. Thenceforth, birds entered the realm of the air to prey upon its teeming insects.

If you examine a feather closely through a strong lens or a microscope, you will see that it is an amazing object. For instance, a flight feather of a large bird—like the wing-tip feathers of a turkey—has a hollow tapering shaft that is stiff but flexible. Branching from both sides of this are "barbs." On both sides of each barb are branches fitted with hooks and flanges which interlace so that the barbs are actually "zippered" together. If you poke in one of its feathers, a bird can zip it closed again with a deft touch of the bill. Another important feature is that the feather's web is "cut on the bias," as a dressmaker would say. Like a man's woven tie, it stretches in length or width when you pull on it but springs back to the original shape.

The web on one side of the shaft of a flight feather is much narrower than that on the other side. If this were not true, flight would be impossible. In flying, birds do not reach forward with the wings and pull backwards: They do not "row" through the air. The wing stroke is up and down. That carries the bird forward because the broad web at the rear of each flight feather meets more air resistance than the narrow front web, and this causes the feather to rotate slightly in its socket as the wing is raised and lowered—something like the slats on a Venetian blind—downward on the upstroke and upward on the downstroke. You may demonstrate this propeller action by using the cap of a fountain pen as the socket for a large feather and imitating a wing beat.

There are many kinds of feathers and many other interesting things to be learned about them. For example, the large flight feathers and tail feathers are covered by much shorter *covert* feathers that serve like shingles on a roof. The *contour* or body feathers grow only on certain parts of the body and are scale-like in shape. They shed rain and the air spaces between them insulate the bird. When you see a sparrow sitting all fluffed-out on a cold Winter morning, he is trapping layers of air inside his feathers to keep him warm.

According to Aristotle: "Fine feathers make fine birds." Could be.

* *Reprinted from* Nature Bulletin *article by William J. Beecher, Sr., Naturalist, Forest Preserve District, Cook County, Ill.*

NEW Legislation–1957

THE following is a listing of new laws, having to do with conservation, passed at the 1957 session of the Legislature. Because of the length and complex wording of these bills, the individual summaries are brief, and, where items of special interest are noted by the reader the complete law should be consulted. References are to the Fish and Game Law unless otherwise noted.

FISH AND GAME

Fish

Section 275 (Effective 4/9/57): Removes restrictions against the use of artificial lights in connection with fishing lakes and reservoirs of Putnam County.

Section 262 (Effective 4/9/57): Changes the closing date of the lake trout season in Lakes Gilead and Glenida, Putnam County, from Sept. 1 to Sept. 30. Provides a uniform open season for all trout in lakes of Putnam County.

Section 268 (Effective 4/9/57): Removes restrictions against fishing at night in Putnam County.

Section 262 (Effective 4/9/57): Provides for a season on rainbow trout from April 1 to September 10 in Chautauqua Creek, Chautauqua County from Lake Erie upstream to a point which would be the junction of Taylor Road and Bloomer Road both extended at the site of an abandoned bridge over Chautauqua Creek.

Section 359 (Effective 7/1/57): Requires a separate fishing preserve license for each body of water defined as fishing preserve waters except where ponds, under one ownership, are supplied by a common source of water and are on one continuous parcel of land.

Section 287 (Effective 1/1/59): Provides that the mesh size of nets, as specified in the law, be measured as prescribed by Department regulations, for standardization of method.

Section 262 (Effective 4/11/57: Provides for a catch limit on trout (except rainbows) of 5 per person per day in Wiscoy and East Coy creeks, Wyoming County.

Section 268 (Effective 4/11/57): Limits a person to one line with a "single hook point" in certain specified rainbow trout streams in the Finger Lakes Region from April 1 through May 15.

Section 265 (Effective 7/1/57): Removes the special restrictions which formerly applied to the use of tip-ups and to the manner of taking fish other than angling in Kayutah Lake in Schuyler County.

Section 262 (Effective 3/15/57): Eliminates the catch limit for white perch in Westchester and Putnam counties.

Section 289 (Effective 7/1/57): Prohibits the taking of sublegal sized sturgeon with gill nets and restricts the taking of sturgeon with other types of nets to the dates of October 1 through May 15 in Chaumont Bay of Lake Ontario.

Section 262 (Effective 3/15/57): Provides a catch limit on trout (except rainbows) of 5 per person per day in the Battenkill, Washington County.

Section 388 (Effective 7/1/57): Makes the general penalty of $60—and an additional penalty of $25 for each fish taken—apply to violations of closed seasons in specified waters in Rensselaer and Putnam counties as it does in other waters of the State.

Section 262 (Effective 3/23/57): Provides for the open season on lake trout in all lakes in Westchester County to be from the second Saturday in April through September 30, to conform with seasons for other trout in that county.

Section 262 (Effective 7/1/57: Provides for a size limit of 18 inches, a catch limit of 5 per person per day and of 10 per day in the aggregate for 2 or more persons in a boat on northern pike in Silver Lake, Wyoming County.

Section 196 (Effecive 7/1/57): Makes permanent the authority of the Department to permit by order the taking of smelt, yellow perch, alewives or suckers with small dip nets and makes clear that it is permissible to use dip nets of metallic mesh.

Section 262 (Effective 6/1/57): Provides for the taking of black bass of any size and in any number from opening of trout season through November 30 from all the tributaries flowing into the Pepacton Reservoir, in Delaware County above the high water mark of the reservoir.

Section 173 (Effective 4/18/57): Provides the Department with additional authority to impose restriction in connection with taking shad, especially for commercial purposes, in the Delaware River and its tributaries.

Section 314 (Effective 7/1/57): Permits the practice of "pollacking" in the taking of scallops.

Section 262 (Effective 7/1/57): Provides a minimum legal length for lake trout of 12 inches in Woodhull, First Bisby and Second Bisby lakes in Herkimer County.

Section 173 (Effective 7/1/57: Clarifies the Department's authority to regulate all methods of fishing in certain border waters, in collaboration with the States of Connecticut, New Jersey and Pennsylvania.

Game and Fur-bearers

Section 201 (Effective 7/1/57): Provides for owner or occupants of farms, lands or dwellings to take at any time in any manner black, grey and fox squirrels injuring property.

Sections 130 and 136 **of the Town Law** (Effective 3/23/57): Empowers town boards to license or otherwise regulate mink raising operations.

Section 228 (Effective 4/12/57): Extends authority of the Department to fix open season and bag limits on ring-necked pheasants, except on Long Island, until 1958.

Section 225 (Effective 9/1/57): Makes provisions for the use of any 22 caliber ammunition, including "long rifle" and of pistols and revolvers designed or adapted for such ammunition in hunting raccoons at night.

Section 234 (Effective 9/1/57): Limits to Game Protectors the tagging of heads and carcasses of legally taken female deer having horns three inches or more in length, in cases where the taker wishes to have the head mounted.

Section 354 (Effective 7/1/57): Requires that a person secure a license from the Department to hold or propagate nutria in captivity.

Section 226 (Effective 7/1/57): Continues until July 1, 1959 the authority of the Department to fix annually, by order, the open seasons for ruffed grouse.

Sections 226, 230, 232 (Effective 7/1/57): Provides for deer and bear seasons in 1957 with the same pattern of opening dates as in 1956, but establishes a uniform closing date throughout the State of the first Tuesday in December, with the following excep-

tion: Bear—Delaware, Greene, Sullivan and Ulster counties the closing date is the third Wednesday in December. Provides for taking deer of either sex on the last day of the open season (December 3) in all counties having a gunning season, with a provision that a person must have a special permit, issued by the Department, to take deer of either sex in the Counties of Putnam, Sullivan and Ulster and the Department may limit the number of special permits to be issued for these counties.

Section 230 (Effective 4/25/57): Provides for an open season for deer of either sex (long bow only) in Westchester County of November 15 to December 31 in 1957.

Other

Sections various (Effective various dates): Provides for hunting, fishing and trapping licenses to be issued for a license year beginning October 1 and ending September 30 effective October 1, 1958. Also contains provisions covering the procedures to be followed in issuing licenses during the period of transition from the present calendar year to the new license year including period and fees. (See detailed article page 32.)

Section 1208 **Public Health Law** (Effective 4/9/57): Provides authority to the Water Pollution Control Board to adopt and enforce rules and regulations governing the use of chemicals for the control of aquatic vegetation.

Section 220 (Effective 1/1/58): Makes permanent the present schedule of fees for hunting, fishing and trapping licenses.

Section 213 (Effective 7/1/57): Extends until July 1, 1958 the right of any member of the United States Armed Forces in active service to fish and hunt without licenses, except for deer and bear, and to trap, except for beaver and otter if he is in uniform or has his leave papers or identification tag.

Section 245 (Effective 7/1/57): Makes applicable to the long bow, the same prohibitions that now apply to firearms with respect to their discharge across public highways and in the vicinity of occupied dwellings.

Section 225 (Effective 4/11/57): Authorizes the Board of Supervisors of Hamilton County to appropriate funds for payment of bounties on bobcats, porcupines and rattlesnakes.

Section 245 (Effective 7/1/57): Makes illegal the carrying of firearms by any one accompanying an archer or a member of his party during the special archery season.

Section 205 (Effective 4/1/57): Provides for continuation of State aid to counties participating in control of rabies in wildlife until March 31, 1958.

Sections 235, 277, 358 (Effective 7/1/57): Various amendments provide for reasonable possession and transportation of legally taken fish and game in line with the changes in practices that have resulted from the extensive use of cold storage lockers and freezers. Provides a common termination date of August 1 for possession of upland game birds, most species of small game, deer and bear. The Department may issue permits extending possession beyond that date. The termination date for possession of fish remains March 1 following the open season in which they were taken. Provides for storage of fish and game in storage locker or other locked facilities owned or leased by the owner, in addition to his dwelling place. Provides for transportation of any quantity of fish and game under Department permit or, if frozen, or otherwise processed without a permit.

Section 217 (Effective 3/11/57): Provides for the use of certified mail by the Department to send written notice, as required by law, to a person who has had a hunting, fishing or trapping license revoked or denied.

Section 240 (Effective 3/15/57): Makes it clear that the owner or trainer of a dog is restricted to his own farmed or cultivated lands in permitting his dog to run at large on lands inhabited by deer.

Sections various (Effective 3/15/57): Corrects certain errors and omissions that were made in the recodification of the Fish and Game Law.

Sections various (Effective 7/1/57): Provides for changes in the Fish and Game Law, the Penal Law and the Code of Criminal Procedure; the major points of which are as follows: (1) Continues classifying serious violations of the Fish and Game Law as misdemeanors but reclassifies the less serious ones to the status of infractions. (2) Provides that acts defined as infractions, heretofore or hereafter committed are not crimes. (3) Authorizes use of summons, instead of summary court arrest, in cases of infractions.

Sections 175, 176, 198 (New) (Effective April 1, 1958): Provides for the adoption of fish and wildlife management practices on private lands including the furnishing of benefits and services to owners and lessees who agree to carry out such practices. Provides for the establishment of State and district fish and wildlife management boards consisting of representatives of landowner, sportsman, county, State and allied groups. The co-operative program provided for in this Act is authorized for the purpose of obtaining, primarily on privately owned or leased lands and inland waters of the State, practices of fish and wildlife management which will preserve and develop the fish and wildlife resources of the State and improve access to them for recreational purposes by the people of the State.

(This legislation is of considerable importance and will be the subject of specific articles in future issues of this magazine.)

CONSERVATION EDUCATION

Section 225 **of the County Law** (Effective 7/1/57): Provides for the appropriation of county funds for Conservation Education, including the promotion of better public understanding of problems and desirable practices in conservation of natural resources.

Section 809a **of the Education Law** (Effective 4/11/57): Authorizes the inclusion of courses of instruction in State schools in the safe and proper use of firearms, game laws, and proper hunting and conservation practices. Such courses to be approved by both the Education and Conservation departments.

FOREST PRESERVE

Concurrent Resolution (*Constitutional Amendment*): To be voted on by the people at the general election in 1957. This amendment would permit the sale, exchange or dedication for forest and wildlife conservation, and recreation, any lands under ten acres in size now owned or hereafter acquired constituting the Forest Preserve, outside the Adirondack and Catskill parks as now fixed by law. It would provide that any moneys derived from sale of these lands be paid into a special fund and expended only for the acquisition of additional Forest Preserve lands within the Adirondack and Catskill parks.

Concurrent Resolution (*Constitutional Amendment*): Approved, to be voted on by the people at the general election in 1957. This amendment would provide for relocation and reconstruction of existing State highways on the Forest Preserve not to exceed fifty miles of such highways and providing not more than four hundred acres of Forest Preserve lands for such purposes. No single relocated portion of any highway to exceed one mile in length.

Section 363 (Effective 4/22/57): Provides for extension of the Catskill Park boundaries in various places to include 107,660 acres of land having forest and recreational value and including 8,000 acres of Forest Preserve lands that properly belong within the confines of the park.

Section 15 **of Public Land Laws** (Effective 4/23/57): Provides that the Conservation Department approve all proposed grants or leases of lands underwater in Lake George to make sure they will not result in navigation hazards, impair scenic beauty or otherwise interfere with the use of this lake by the people of the State.

Authorization (Effective 4/23/57): Directs the Conservation Commissioner to have a survey made of the shoreline of Lake George to determine the mean low water line, and, if there are any unauthorized encroachments on State lands under water to report them to the Commissioner of the Land Office. If such encroachments are unauthorized the Land Board will notify the individual involved that unless application is made by him for consideration of grant or easement of such lands within six months, the Land Board shall institute proceedings authorized by law.

—Earl A. Westervelt

the back of the book

Change in license year

One of the important conservation measures passed by the 1957 Legislature and signed by Governor Harriman was the bill which changed the effective term for hunting, fishing, and trapping licenses from the calendar year to a license year beginning October 1 and ending September 30. The bill provides for the change to take effect *October 1, 1958.*

These licenses have been issued for the calendar year since they were first required. A large proportion of the State's hunters and fishermen take out their licenses shortly after the first of the year, and in the Spring before the beginning of the fishing season. A major disadvantage of the calendar year basis has been that it is impossible at that time to furnish copies of the laws and regulations which will be in force during the life of those licenses. There are definite reasons why this cannot be done.

The Legislature meets each year early in January and is usually in session until late March. During this period it may —and usually does—pass a substantial number of bills affecting fish and game on which the Governor has thirty days to act following adjournment of the Legislature. It is, therefore, about May 1 before the Department knows what new laws or changes in laws have been enacted. Even though text material is ready to go to the printer as soon as the changes are known, approximately six weeks more are required to obtain delivery of the printed Fish and Game Law. Thus, the earliest date that the new laws can be made available for distribution is the middle of June. The Fishing Guide, incorporating new laws affecting fishing, cannot be furnished until about the same time; well after the fishing season is underway.

Furnishing hunting and trapping regulations poses even greater problems. The Legislature has delegated authority to the Department to fix the open seasons on most species of small game and furbearers on the basis of the estimated abundance of the various species during the hunting and trapping season. Such determinations based on field surveys, cannot be made properly before the early part of the Summer. Furthermore, the basic regulations for the waterfowl season, set each year by the Federal government, are not available to the Department until August. The Hunting and Trapping Guide cannot be ready for distribution, therefore, until about September 1.

The new license year beginning October 1, established by this bill, is designed to overcome these disadvantages. In the future, licensees can be given a complete set of hunting, fishing and trapping regulations which will be good for the license year—when they purchase their licenses.

The bill also contains provisions to accomplish the change-over from the calendar year basis to the new license year with a minimum of inconvenience to all parties concerned. The issuance of licenses for the calendar year 1957 is not affected. For the period from January 1, 1958 through September 30, 1958, hunting, combined hunting and fishing, and trapping licenses will be issued on a nine months basis at a fee of three-quarters of the annual fee, exclusive of the fee to the issuing clerk. Fishing licenses will be issued for the same term at the regular annual fee since this period covers the major part of the important fishing seasons.

Big game and archery licenses will not be issued during the transitional nine months period since there will be no open seasons for big game at that time of year. For the license year beginning October 1, 1958 and ending September 30, 1959, and in subsequent years, all hunting, fishing, trapping, big game and archery licenses will be issued at the annual fees established by the Legislature.

The bill to change the license year was introduced upon recommendation of the Joint Legislative Committee on Revision of the Conservation Law and was supported by the Department, individual sportsmen and various sportsmen's organizations. By making it possible to furnish hunters, trappers, and fishermen with current laws and regulations at the beginning of the license year, it will solve a problem that has perplexed licensees, tormented issuing agents, and vexed the Department for some time. It is believed it will also represent another step in improved administration of the highly valued fish and game resources of this State.—W. M. LAWRENCE, *Assistant Director, Division of Fish and Game*

Big business

The nationwide Crossley hunting and fishing survey indicated that in 1955, sportsmen in this country spent $1,914,292,000 in sport fishing. Of this amount, more than $333 million was spent on boats and motors.

Homebodies

Creel census studies of marked fish stocked in a mountain trout stream in New Hampshire have turned up some interesting information on the movement of stocked trout.

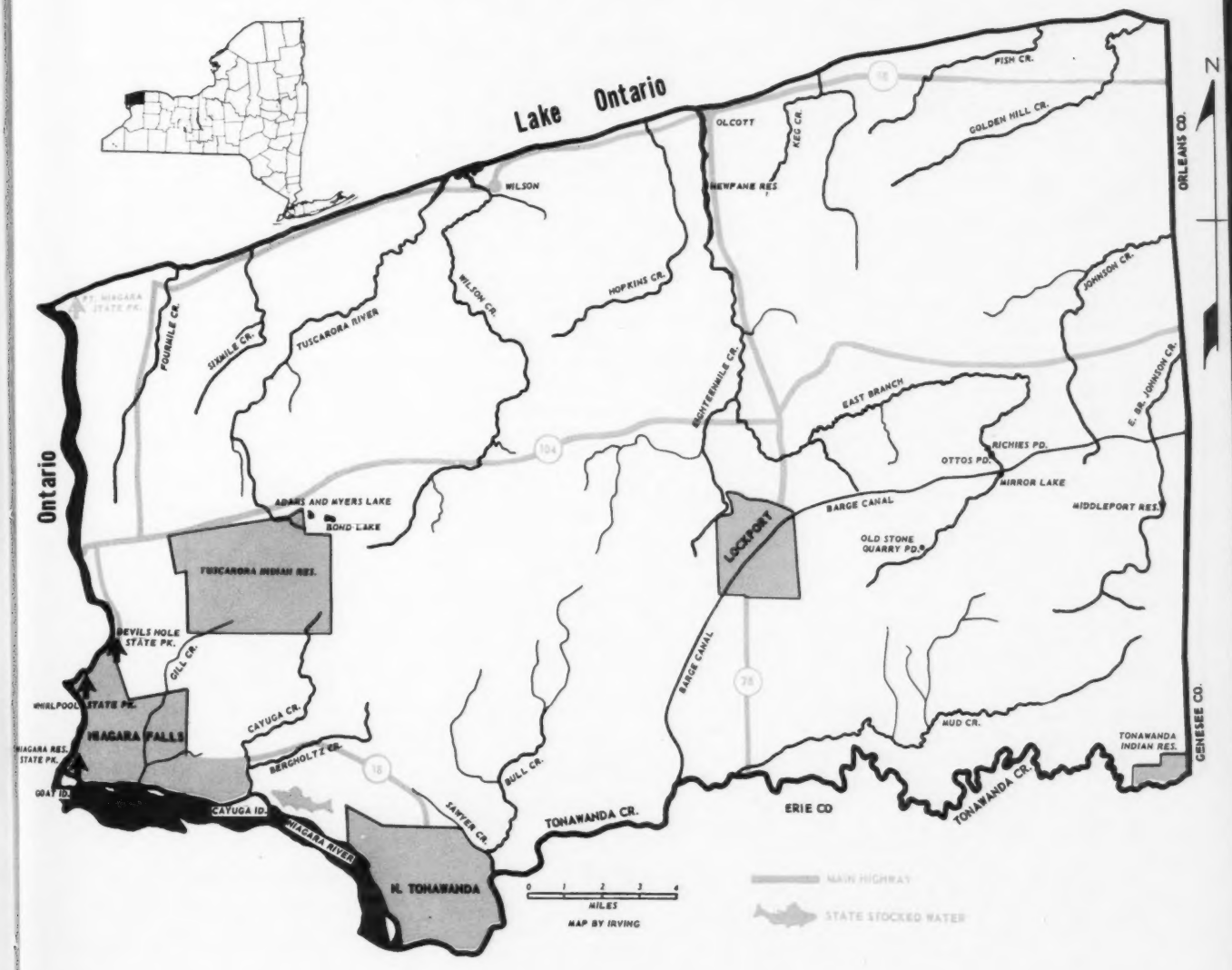
The two-year study, reported on in the April issue of *The Progressive Fish Culturist* by Arthur E. Newell of the New Hampshire Fish and Game Department, indicated, in the case of brook and rainbow trout, that the largest percentage of the fish stocked were captured in the immediate vicinity of original release. Of those that did move from the area of release, the brook trout, in all cases, migrated farther than the rainbows.

It was found, also, that trout stocked early in the season in cold water had a greater tendency to move than those stocked later after the waters warmed up, but even where movement was noted, most of the stocked fish migrated less than three-quarters of a mile from the pointing of stocking.

Fiberglass canoe

In this modern plastic age, here's further proof that we probably never shall go back to birch bark. The fiberglass canoe pictured here—a product of the Mountain Ash Fiberglass Co. of Hudson —is 17 feet long, has a 37-inch beam, a depth of 13 inches and weighs an even 100 pounds. The makers claim it is vermin and fungus proof; tougher than wood or aluminum.

Niagara County



N.Y.S. Conservation Department Offices

District Forester	335 East 3rd St., Jamestown
District Game Manager	2130 Scottsville Rd., Scottsville
District Fisheries Manager	2130 Scottsville Rd., Scottsville
District Game Protector	304 State Office Bldg., Buffalo

Farm Service Offices

Niagara Co. Soil Cons. Dist.	Farm and Home Center, Mounted Rt. 20, Lockport
Niagara Co. Agri. Agent	Mounted Rt. 20, Lockport

—Roy Irving

Finger Lakes Rainbows

(Continued from page 22)

When growing conditions are not so promising, these repeat spawners are better considered excess baggage. A Grout Brook female weighed 1.9 pounds when tagged in 1953 (Tag Number J994). *Three* years later she weighed 2.8 pounds, a gain of 0.9 pounds. The second fact is that a higher percentage of females survive to come back as repeat spawners. The explanation for this probably concerns stream mortality during the spawning runs, for males come upstream first and remain longer than females. They may run much greater risks from natural dangers, out-of-season poaching, and perhaps, come April 1st, from angling.

Natural predators, physical dangers, disease, and other factors of natural mortality, stalk all Finger Lakes rainbows throughout their lives. Fortunately many of them survive to tangle with garden hackle or a tapioca ball on a No. 6 hook, or a Geneva "66." The oldest rainbow we have aged in the past few years had a life span of eight years. Life history and growth studies provide facts that place fishery biologists in a better position to manage Finger Lakes rainbows—and to help preserve this valuable resource for years to come.

Forests and Waters in New York

(Continued from page 5)

Long before the present time, however, the deteriorated areas have come back to a complete cover of forest. As a result watershed conditions are now certainly stabilized, except for some possible remaining effects on the magnitude of storm peak discharges and of low Summer flows.

What are likely to be the effects of the timber-harvesting operations that are still being conducted on privately-owned lands; of road construction on these or other lands; or of any possible timber stand improvement work anywhere in the Adirondacks? These effects should be correlated with the degree of disturbance of the vegetation and soil that are caused by such operations.

Take logging, for instance. I do not like the "commercial clear-cut" operations that still seem to be common practice. Unless carefully planned and accompanied by timber stand improvement, they are likely to leave a thin stand of stunted trees, culls, and unsalable species. If accompanied by fire protection and careful road installation and maintenance, however, even such silviculturally destructive operations may have relatively little impact on watershed hydrology. They cause temporary reductions in water interception losses and transpiration, which are partially offset by increased evaporation from the exposed land surface. Ordinarily the ground is still well covered with litter, humus, and understory vegetation; and surface runoff is not likely to be noticed except in skid-roads and trails.

Correspondingly less intensive forest operations such as thinning, timber stand improvement, or light selection cuts would be expected to have a proportionately smaller hydrologic effect. Again except for the effects of skid-roads, it is quite likely that no harmful effect on watershed hydrology would result; the only effect would be some increase in total water yields, and perhaps in the height of Spring freshets.

You will notice my repeated reservations concerning the effects of logging roads and trails. Even in areas with relatively stable hydrology it has been repeatedly observed that the construction of highways, logging roads, and skid trails has a real impact on the distribution of streamflow and the occurrence of sediment.

There are several good reasons for this effect. For one thing, any road and most skid trails take off the surface protection of litter and humus, exposing mineral soil to the beating of rain and the washing of runoff water. More important in relatively wet climates such as the Adirondacks, a road along a side hill makes a definite cut through the soil mantle, which serves like a drainage tile for the watershed land above the road. This means that subterranean water, which would normally move quite slowly through the soil, suddenly comes out at the surface in the road cut. This is commonly observed in "wet-weather springs" and seeps of water running out from road cuts during and soon after storms. This water moves into the roadside ditch and proceeds with great rapidity to the nearest stream, picking up soil from the road cut and surface as it goes. Thus, if the watershed is interlaced with a network of logging roads, skid trails, and highways, the natural regimen of the streams draining the watershed may be substantially changed. This means, of course, the need for careful road design and construction, with ample protection against erosion.

What conclusions can we draw from this brief summary of forest and water problems in New York State? First, certainly hydrologic conditions in the State are pronouncedly different from those of pioneer days. These differences are due primarily to the removal of forests, the cultivation of large areas of land, and the settlement of valley bottoms with rich farms and communities. To a somewhat lesser degree, they are due to the deterioration of the remaining forests by cutting and fire. Generally speaking, though, the impacts of forest deterioration on watershed hydrology in New York State are not as pronounced as can be observed in many other areas in the United States. Except for portions of the State such as the upper Susquehanna watershed, the effect of forest deterioration on the watershed can be expected to be pronounced only after fire or excessive road construction.

Water pollution

Water pollution abatement programs across the country received a "shot in the arm" when Congress appropriated $50 million for construction grants to municipalities to help finance sewage-treatment plants during the current fiscal year. Of this New York State has been allocated about two and three quarter million dollars. Grants are limited to 30 per cent of the cost of the project or $250,000 whichever is smaller. It is also stipulated that half of the money must be distributed to projects serving less than 125,000 people. Application forms have been mailed to the states for use by municipalities and interested city officials can secure them, with instructions, from their state water pollution control agencies.

To become eligible for construction grants, projects must be in conformity with the state water pollution control plan and must have been certified by the state water pollution control agency as entitled to priority over other eligible projects on the basis of financial as well as water pollution control needs. Among other conditions, to become eligible, a project must also be part of a comprehensive water pollution control program developed cooperatively by the Public Health Service, other federal agencies, state and interstate agencies, municipalities and industries.

Slain by a horse

This was the verdict in a recent assault case out in western New York. The victim was a deer and the deerslayer was "Speck," a riding horse owned by a Livingston County farmer.

Many a time Speck had shared a pasture with hungry deer with no apparent objections. As a matter of fact, Speck had a reputation of being as gentle as a kitten. That is, until the late deer came into the barnyard and crowded him (her) and a pony buddy around the oat bucket. Three suddenly became a crowd and the horse and pony ganged upon their uninvited guest. Speck's hoofs caught the deer broadside. It went down with a broken back and never got up. A Game Protector was called and ended its agony with a well placed shot. And venison was on the menu of a Geneseo institution.

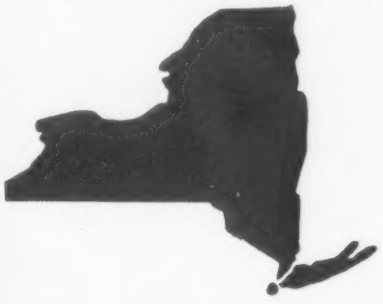
Salamanders and Lizards

(Continued from page 28)

13-15 days to hatch in the laboratory and probably longer in nature. The larvae lose their gills and transform into adults after 56-125 days.

The adults spend their days under debris and rocks of the moist forest floors and remain active till frost forces them deeper under the soil and into cracks and fissures for hibernation. In Fall, when the new adults have emerged from the water 20-30 may be found under a single log; otherwise they are much more solitary. Larvae eat aquatic insects; the adults add earthworms, slugs and adult insects to their diet.

SPOTTED SALAMANDER (*Ambystoma maculatum*): 5½-8 inches. It is more widespread and common than Jefferson's Salamander and the habits of the two are very similar, although the breeding season of the Spotted averages 2-3 days later than that of Jefferson's. Their nuptial dance is a real wing-ding compared with that of the Jefferson's as there are often as many as 100 individuals in the "squares" and the water seems to literally boil with their activity.



Occasionally a belated Jefferson's or two is drawn into the dance. The dance will be carried on in the full beam of a flashlight; the participants apparently oblivious to the spotlighting of their act. The egg masses of the Spotted Salamander assume a more globular shape than the Jefferson's and are less likely to fall off the supporting twigs. Egg hatching periods and larval periods are about the same as those of the Jefferson's as are their food habits. The young adults of the Spotted Salamanders scatter and are not as likely to be found in groups under logs and stones.

MARBLED SALAMANDER (*Ambystoma opacum*): 3-4¾ inches. Where found it may be fairly common. Coloration is more attractive than its close

cousins', the Jefferson's and the Spotted. Unlike its cousins, however, this salamander lays its eggs in Fall and *on land*. This seems odd because the larvae are lunged and completely aquatic. The female builds a "nest" which is nothing more than a hollow in the ground near a stream or marsh and guards the eggs till they hatch or the nest is flooded. The body of the mother helps maintain the proper humidity and the hatching may occur in a few days. Nest sites are generally chosen where there are frequent floodings and thus the young are carried into the water where they remain with little growth through the colder months. They grow quickly in Spring and transform into adults in June or thereabouts. The feeding habits include earthworms, beetles and other insects. The larvae eat aquatic insects and snails. The Marbled Salamanders seem to prefer drier habitats than the Jefferson's or Spotted Salamanders.

TIGER SALAMANDER (*Ambystoma tigrinum*): (Not pictured.) 6-10 inches. Its presence in central New York, as shown on map, is doubtful. In the tropics and warmer temperate regions this sala-

mander maintains its larval aquatic form throughout life reaching sexual maturity in this stage. The scientists refer to this type of vagary as "neoteny." It results in the Mexican form of this salamander being known as the Axolotl. The Axolotl which has the doubtful honor of being one of the few species regularly eaten may grow to 12 inches or more unless he is captured by a human and eaten first. They are considered a delicacy. It took the scientists many years to discover that our Tiger Salamander and the Axolotl were one and the same species. Their body form is very similar to that of the Spotted Salamander. The ground color on the sides and back ranges from dark brown to dull black; the ventral side is olive yellow. There are numerous paler buffy-brown to buffy-yellow blotches of irregular size and shape over the body which may form bands on the tail. The blotching on the ventral side is darker. The life history is similar to that of the Spotted Salamander though generally egg laying and other habits occur a few days later and the larval period may last as long as 140 days; under some conditions through the Winter. Food habits are not well-known in New York, but they have been known to eat worms, insects and small tree frogs.

Sportsmen and Conservationists

(Continued from page 15)

Conservation Jobs Your Club Can Do

The Let's Build Series, how-to-do-it publications on most of these projects, is available free in single copies from the National Wildlife Federation, 232 Carroll Street, N. W., Washington 12, D. C.

Spring and Summer

Graft Fruit Trees
Prune Fruit Trees
Plant Shrubs
Plant Trees
Plant Willows
Plant Odd Corners
Farmer-Sportsman Relations
Stiles
Safety Zone
Windbreaks
Bank Piers
V-Dams
Log Dams
Rock Dams
Check Dams
Spawning Beds for Bass
Spawning Beds for Trout
Brush Shelters for Fish
Adopt a Reservoir
Adopt a Stream
Stop Pollution
Build a Pond
Build a Marsh
Trap Snapping Turtles
Boxtrap Bunnies

Fall and Winter

Build Wood Duck Shelters
Erect Wood Duck Shelters
Brush Shelters for Wildlife
Conservation Education

The killdeer

One of the surest signs of Spring is the sight of the first killdeer or the sound of its plaintive call: "Kill-dee! Kill-dee!" Of all our shorebirds, it is the first to arrive, just as it is the last to leave in Autumn. The killdeer is also the most widely distributed and best known, breeding throughout North America from central Canada to central Mexico and wintering as far south as Venezuela and Peru.

Most of the shorebirds—a long-legged, long-winged group which includes the phalaropes, curlews, snipes, sandpipers and plovers—usually inhabit the edges of oceans, lakes, ponds, sloughs and streams. The killdeer, however, is a landlubber commonly found many miles from water on meadows, pastures, golf courses and, especially, plowed fields. It is a friend of the farmer because it feeds greedily on worms, grubs, grasshoppers, beetles, bugs and weevils—many of them very injurious to crops.

The killdeer is one of the plovers, which differ from sandpipers in having chunkier bodies, shorter thicker necks, larger eyes, and more conspicuous plumage. Also, its pigeon-like bill is not built for probing in mud or sand. Its white throat and underparts are boldly marked by a black band around the neck, another black band across the breast, and a third—from eye to eye—above its white forehead. The eye is surrounded by a red ring. The rump and upper tail feathers are orange-brown.

This bird is so easily alarmed, and then so noisy, that it was given the scientific name *vociferus* and has local names such as "squaller," "telltale" and "noisy plover." When a person approaches the nest, one or both parents put on a very convincing broken-wing act, screaming and fluttering away as if wounded, to beguile the intruder from the eggs or young. Frequently, however, one of them circles swiftly overhead, uttering loud strident cries. During the breeding season a long trill, by the male, is often heard.

The killdeer likes an open place for its nest, which is merely a shallow saucer-shaped depression on the ground, lined with grass or pebbles. Closely grazed pastures, cultivated fields, or barren areas such as gravel bars and beaches are favorite locations. We discovered one in an abandoned parking space near Maywood, Ill., but, after watching the "crippled" antics of the female, we had trouble finding it again. The eggs are so camouflaged with irregular blackish blotches and scrawls that, from a few feet away, they were indistinguishable from the gravel surface around them.

Like other shorebirds, the killdeer lays four large eggs which are pointed so that, when placed with the smaller ends together at the center of the nest, she can cover them. When hatched, as soon as the moisture has dried from their down, the fluffy little young leave the nest in search of food and, like their parents, can run swiftly. Their coloring resembles that of the adults but those bold markings—instead of betraying them, as you might expect—actually help to conceal them when motionless.

The killdeer has benefited greatly from the changes which have occurred since the country became settled and farmed. It commonly follows the plow and the cultivator to pick up worms and grubs. Croplands and pastures furnish an abundance of insects. It is a very swift and graceful bird in the air or on the ground. To "run like a killdeer" is a common saying.

No longer a game bird, like snipe and woodcock, it is protected now.—KARL E. BARTEL

C.P.A.

Being human (we think) we welcome words of praise for THE CONSERVATIONIST no matter where we find them, and sometimes we find them in the darndest places. Who, for instance, would expect a professional society of public accountants to be concerned with our welfare? They are though, we're pleased to say and to prove it, we quote Leonard Houghton, C.P.A. Saranac Lake Branch, Adirondack Chapter, writing in the October, 1956 issue of their journal—*New York Certified Public Accountant:*

"'*Conservationist*' is not a word that you can use playing Scrabble or in crossword puzzles. It is the name of a slick-paper magazine published by the good old State of New York. Perhaps you take it; it is a bi-monthly at $2 per (yes, year).

"All the members of this notorious Adirondack Chapter get a subscription with their chapter membership—the same as they also get expenses paid to C.P.A. conferences, Prentice Hall tax services, *U. S. News*, a daily paper, an oil painting for the office, a clock, a thermometer, a barometer, etc., etc.

"Well, you should read the letters to the Editor in this CONSERVATIONIST; pages of them and so interesting that the time-to-go-sleep comes much too soon. The pictures are beauties, many in color. The articles tell all about animals, birds, fish, lakes, brooks, woods, mountains—our great natural resources.

"The final pay-off is provided by Clayt Seagears—an article on the last page illustrated in color on the inside back cover. The August-September issue is about a humming bird, a cat bird, a katydid and Pa and Ma Spider. It's a humdinger; it makes you rock-an'-roll—mentally.

"With this magazine at hand you can spend an evening in the open spaces any time you need to recreate yourself."

• Thanks Len.—Editor

Mechanical lumberjack

This machine, appearing, as pictured here, like the business end of a jet engine, should have lumberjacks rubbing their eyes. Feed a tree, limbs and all, into its maw and out the other end it comes, neatly de-limbed and cut into lengths for pulpwood or fence posts, as desired; and all in a matter of seconds.

Designed and built by a Cornell University professor and a graduate student in agricultural engineering, it's hoped that this machine will streamline thinning operations and overcome "stagnation" in New York State's half million acres of forest plantations which never will produce valuable timber unless thinnings are made in the near future.

The inventors are now busy figuring out how they can add a de-barking operation to this mechanical lumberjack.

Interested plantation owners are referred, for further information, to Extension Service, N. Y. State College of Agriculture, Cornell University, Ithaca.

Goiter

A deficiency of iodine in the diet causes goiter in trout—and in humans.

Outboards and fish

Interesting new observations on fish behavior have resulted from underwater diving activities in connection with a Federal-aid fishery research study at Lake Travis in Texas. The work is helping to develop the potential and limitations of underwater observations as a research tool, as well as developing new insights into fish behavior.

The study showed that surface noises apparently have little effect on fish at depths of over ten feet. A 10-horse power outboard motor was used frequently in the diving areas while observations were in progress. No difference in numbers of fish seen or general activity was noted during periods of extensive use of the motor and periods when the motor was not in use. On one occasion the boat was run at full speed back and forth over the test area. The fish in the area completely ignored the motor noise and continued normal activities. With the exception of a small whirring noise, no effect of the motor below ten feet was noticeable. The divers ranged in depths from three to 20 feet in an attempt to evaluate the motor effect.

New record

Sales of 1,218,781 hunting licenses during the 12-month 1955-56 period retained for Michigan its lead as the top hunting-participation State in the nation, the Wildlife Management Institute reports. The next highest State, New York, reported the sale of 975,551 hunting licenses.

California replaced Minnesota as the No. 1 state in fishing license sales, but these two with Michigan and Wisconsin, exceeded the one-million mark. Compilations by the U. S. Fish and Wildlife Service show that during the fiscal year ending June 30, 1956, there were 33,163,831 hunting and fishing license holders in this country, an increase of 117,470 over the previous high of 1955.

An increase of 270,296 hunting license holders is responsible for the new record. Fishing licenses decreased by 152,826 during the last year. The national outlay for 18,701,983 fishing licenses and 14,461,848 hunting licenses added up to $98,787,867—$42,149,647 from anglers and $46,638,220 from shooters.

Mourning doves

Gunning pressure on mourning doves has increased considerably in the past five years and is expected to mount even further as more gunners turn to trying their skills on this elusive target.

A recent survey shows that 19 million mourning doves were bagged by hunters in 29 states and one Canadian province during the 1955 shooting season.

Bait in a bag

Experiments carried out in Ohio on holding bait minnows suggests that fishermen may shortly be able to walk into a bait store and order a bag of minnows.

In an effort to cut down on holding mortality and, at the same time, prepack bait minnows for handy delivery, Ohio biologists have been very successful in using perforated plastic (polyethylene) bags for this purpose. Minnows in lots, up to 500 in number, are poured into the bags, the bags closed with rubber bands, and then set free to drift in the holding pond or tank until needed for delivery.

They report that a noticeable feature peculiar to bag-confined minnows was that their continued attempts to escape—the swimming action, concentrated into a small area—tended to "boil" or agitate the water and thus aerate it.

Sportsmen, Scouts and Conservation

The Middleburg Rod and Gun Club, one of the really progressive sportsmen's clubs in the State, is at it again. Shown above is a representative of that club with a Department field man and a few of the local Explorer Scouts working last Winter on a game habitat improvement program. Included in this co-operative project with the Boy Scouts is pruning old abandoned orchards and piling the cuttings to provide added food and shelter for wildlife. Additional projects carried out by the club in recent years include a wood duck nesting box construction and placement program, the creation of a 7½-acre trout pond, completion of a stream improvement program and sponsorship each year of a co-operative fur auction.

These are the sort of conservation practices on which Scouts, with willing hands and strong backs, are eager to help.

Eviction

From Tony Taormina, District Game Manager for the Department in North-Central New York, comes this pictured evidence of the current housing shortage—a colony of hornets at home in a wren house on the Robson Home Farm near Hall. The wrens—no tenement dwellers—had presumably moved out to seek more congenial neighbors.

The photo, Tony reports, was taken by Bob Strosnider who, when not taking pictures of hornets' nests in wren boxes—and getting stung twice for his pains—is carrying on research in genetics to develop a variety of corn that will be especially suitable for game management purposes. We think another productive avenue for research work would be the development of a race of non-stinging hornets.

Business vs biology

A recent survey conducted by the Mid-West College Placement Association revealed that starting salaries paid during 1956 to college graduates by 200 major U. S. companies averaged $400 per month. These same companies indicated they would this year seek about 32 per cent more graduates than in 1956. At the same time, states looking to fill vacancies in wildlife research and management, will offer qualified university graduates an average starting salary of $323 per month. In five years, if the biologists survive the economic pinch, they can look forward to raises bringing their average salary up to $400 per month—the starting rate today in business and industry.

With this spread, it's easy to understand why state and federal conservation agencies are finding it so difficult to recruit qualified personnel. It's easy to see too why a biologist must have a consuming interest in the field of conservation. He's seriously limited as a "consumer" in other respects.

Scholarships on the stump

"Well, Mert, another grandchild; guess you'll have to plant another 10,000 trees." That's what a friend told Merton R. Bean of McGraw, when he became a grandfather for the thirteenth time.

Mr. Bean, a charter New York member of the American Tree Farm System and a Forest Practices Act co-operator, did plant the trees. In fact, altogether he has planted a total of 137 acres since 1926—all with the definite idea of providing income to help educate his grandchildren.

Helping to spur Mr. Bean on with his planting has been the fact that income from selective harvests on his 209 acres of natural woodland definitely helped to give all four of his children a college education. He received a total of $6,400 for two different cuts of 75,000 board feet and 145,000 board feet.

While Mr. Bean says, "there isn't much eating money in planting trees for a good many years," he is convinced it will pay off eventually. In the meantime, he is doing his best to make sure his plantations produce the most and highest quality lumber possible. Putting in time on his woods on the average of four days a week, the Cortland County Tree Farmer has thinned and pruned over 70 acres. (That's Mr. Bean up a tree in the picture above.)

Workshop receives award

The New York Sportsmen's Conservation Workshop at Cornell University's Arnott Forest, attended each Summer by representatives of leading sportsmen's groups in the State, was recognized by the Wildlife Society at this year's annual meeting in Washington. The Society awarded the Workshop its Conservation Education Award and cited Harlan Brumsted of the University's Conservation Department for his organizational ability in developing the excellent program of training in conservation of natural resources.

The workshop, sponsored by Cornell in co-operation with the New York State Conservation Council, offers sportsmen an opportunity to study, first hand, the fundamentals of soil, water, forest and wildlife conservation and to keep abreast of the latest developments in the proper management of these resources.

Electronic fish tally

According to *The Progressive Fish Culturist*, fisheries biologists will no longer need to keep a round-the-clock watch to check the population trend of a fishery —as reflected, for instance, by the spawning run of trout. They can now get the answer electronically. Here's how it works: Fish pass through two plastic "tunnels" in the bottom of the uppermost pool of a fishway. In each tunnel, two distinct electrical fields of low voltage are created electronically. As fish flesh is a better conductor of electricity than water, movement of a fish through a tunnel causes an increased flow of electricity. This increased flow trips a series of electronic relays, which actuate a "logic device" that records passage of the fish—upstream or downstream—depending on the sequence in which the relays are tripped.

National forest receipts

Total receipts from the national forests during the past fiscal year will reach $110 million, well above the previous high of nearly $80 million collected during the fiscal year 1954-55, the Wildlife Management Institute reports. Most of the increase came from a substantial rise in the volume of the timber cut.

Although more timber was harvested this year than ever before, Forest Service officials point out that even more could be cut per year without affecting the continuous yield from the national forests. The limiting factors in harvesting national forest timber are said to be access roads and personnel to plan and administer sales under good forestry practices.

Report from D. U.

Approximately $5,000,000 has been spent by American sportsmen through Ducks Unlimited during the past nineteen years for the actual work of restoring and building the principal duck breeding grounds of the North American continent—the prairie provinces of Canada. Federal funds cannot be spent for such purposes outside our nation's borders. Sportsmen contribute to Ducks Unlimited to finance the task of preserving the nesting areas of ducks and geese in Canada, where more than 65 per cent of our continent's wildfowl raise their young, and thereby strive to perpetuate the sport of wildfowling for the future.

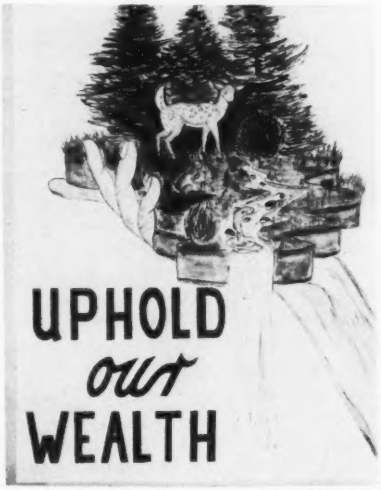
48-D in '56

The Conservation Department made giant strides last year in its Federal aid, habitat improvement program. Ben O. Bradley, Supervising Game Manager, who has charge of this big project, submits the following summary of accomplishments for 1956. (The report, he states, is 95 per cent complete):

Number of marshes built	53
Number of pot-holes (pondlets) built	175
Number of trees planted:	
Wildlife clumps	293,300
Block planting, S.C.S.-F.P.A., Co-operative	465,900
"Wildlife" shrubs distributed from nursery	1,602,700
Project planted	90,175
Protective fencing:	
Rods built	3,284
Acres protected	484

It's important to note that while some of the habitat improvements listed were carried out on State lands, the great majority were accomplished on private lands in co-operation with the landowners.

Conservation poster



This conservation poster, the work of Kenneth Elmendorf, a senior at the Voorheesville Central School, won first prize in a recent contest sponsored by the Kiwanis clubs in that district in co-operation with the school. It was one of 12 winning posters on the conservation theme, judged on effectiveness and originality of idea and artistic ability.

New decoy rig

The Johnson Motor News recently reported the following new wrinkle in duck hunting strategems: "An experienced duck hunter was sitting in his blind one foggy day, when he heard a series of amateurish squawks on a duck call. He didn't pay much attention to this disturbance, until he noticed that the noise (that's the best way to describe it) was coming

closer. Looking out of his blind, he was shocked to see a lone hunter in a boat, slowly rowing along. The hunter would stroke with the oars, scanning the sky for an approaching flight of waterfowl, and then he would raise his head and make another squawk on his duck call. And, bobbing along in the wake of his boat was a string of 50 decoys, all tied together on one long cord.

"Puzzled at the sight, the man in the blind asked, 'What are you doing?' The tyro in the boat replied, 'There didn't seem to be many ducks on the other end of the lake, so I thought I'd try trolling for them'."

Forster receives Nash Award

Among those in the non-professional category who this year received the coveted Nash Conservation Award for contributions to the cause of conservation of natural renewable resources was a New Yorker, Herman Forster, attorney, of New York City.

One time President of the New York State Conservation Council and long active in the affairs of that organization, Mr. Forster was cited for promotion of sound conservation policies of this Statewide sportsmen's federation.

Patriarch

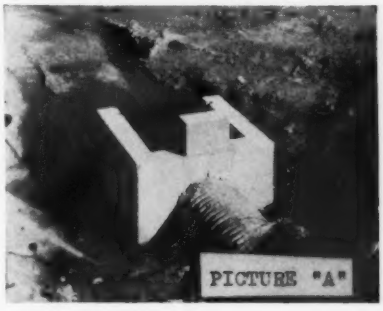
Pheasant No. 13552, shot last year near Stafford, Genesee County, has gone down in the Conservation Department's records as perhaps the longest living specimen of its kind. This numbered leg band was one of thousands turned in to the Department's Game Research men following last Fall's hunting season.

According to the record, this cock bird was released in Genesee County at about 8 weeks of age during the Summer of 1947.

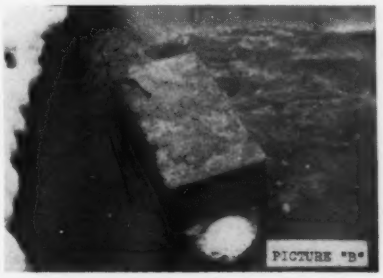
Fishing stool?

Could be, but it wasn't designed as such. We are referring to the concrete block on the back of the outlet box used in the construction of wildlife ponds which play a major role in the Conservation Department's wildlife habitat development program.

These developments are showing up in ever increasing numbers throughout the State, and many people are curious as to the reason for the block. A verbal explanation is not very effective unless one has seen the device in operation, serving its intended purpose. The accompanying photos should help. They were taken at the Robb wildlife pond, a 6.6-acre development built in 1953 in the Town of Perry, Wyoming Co.



The block (Picture A) is an integral part of a well designed and constructed pond of this type. It is an anti-swirl device which prevents the water from "whirlpooling," thereby decreasing the efficiency of the pipe which carries the water under and through the dam. The high water pictures were taken after a very intense rain and thaw. Water was 8" above normal in the pond and, without the block, a whirlpool with hollow center would have developed, decreasing flow through the pipe. Instead, it appears that the pipe was barely operating.



(Picture B). To prove otherwise, see Picture C taken of the outlet end of the pipe which shows it operating at near capacity.

Sodium arsenite

Sodium arsenite is one of the chemicals that has been widely used in efforts to control aquatic vegetation in small lakes and ponds. It has been thought that with this herbicide there is a wide safety margin with respect to fish kills. Recent experiments in Alabama, however, have shown that concentrations as low as four parts per million of sodium arsenite in the water resulted in a 30 per cent reduction in bluegill production and a very noticeable decrease in bottom organisms.

Eventful life

Steve Fordham, foreman of the Department's Game Farm, at Delmar, learned this Spring what had happened to one of his errant charges—a Canada goose, band No. 280, that escaped from the farm during the Summer of 1955. It was shot during the 1956 hunting season in Dorchester County, Maryland and the band number reported. This same goose first checked in with the Department back in 1954 when, on April 13 of that year, it was live-trapped and banded on the Oak Orchard Game Management Area in Genesee County, then shipped to the Delmar Game Farm.

Conservation directory available

The 1956 conservation directory, "Organizations and Officials Concerned with the Protection of Wildlife and Other Natural Resources," is now available. This pamphlet lists the public agencies and officials of national, state and territorial governments of the United States, as well as those of other nations in North and South America. Most of the non-government conservation organizations within the United States which have national or statewide scope are also included.

The Directory is available at 40 cents per copy from The National Wildlife Federation, 232 Carroll St., N.W., Washington 12, D. C.

Marked fish

Oregon fisheries biologists are using liquid latex in various colors, injected under the skin with a hypodermic needle to mark fish stocked experimentally.

Letters to The Editor

Conservation

Dear Sir: Conservation today has become a household word and is being promoted on a scale undreamed of fifty years ago. The ideas expressed by certain people who are, in one way or another, interested in conservation appear to be at variance with the basic concept of conservation as we know it today.

I will limit my discussion here to the conservation of forests and wildlife, although the same concept applies to all natural resources.

The conservation movement received its initial impetus at the turn of the century, under the beneficent leadership of Theodore Roosevelt. In those days, conservation meant to preserve, to lock up, withhold from use, to save for future generations, or to safeguard against wasteful exploitation. There are many people today—well-meaning, educated people—who still adhere to the narrowness of this outdated concept. It must be remembered that in the days of its inception, the conservation movement was attempting to put a brake to the shameful exploitation of the forests and wildlife that was then rampant. The measures advocated necessarily had to be stringent, possibly because in the minds of those early conservationists time was running out, and too, policies based on sound management practices derived from scientific research had not yet been formulated.

As time went on and more knowledge was gained about the management of the forest and wildlife resources, the term conservation took on a broader meaning. No longer was it seen necessary to keep the forests from use. The idea evolved into one of wise use or the perpetuation of (renewable) resources by harvesting them scientifically and *not faster* than they were renewed. A report issued by the National Resources Board (1934) defines conservation as "the orderly and efficient use of natural resources in the interest of national welfare—without unnecessary waste."

Many people cannot quite grasp the idea of "harvesting" timber or wildlife, and yet that is exactly the goal of conservation in its truest sense. Conservation, if it is taken to mean *no* use ceases to be worthy of the name and defeats its very purpose. Whether some of us like it or not, we must face the fact that timber and wildlife are crops. And, as with all crops, unless they are harvested when their time comes, they will die and we humans will be deprived of their benefit. A tree lives to a certain age, then decays, and dies. Wildlife numbers can outgrow the ability of the habitat to support them, and inevitably starve.

It is the purpose of conservation, I believe, to enable us to share in the good that is to be derived from wise utilization of these resources.

T. V. Lacher, Talladega, Alabama

• *Clear, concise and true.—Editor*

About garbage

Dear Sir: The greatest times of my life are spent fishing at my favorite streams, the Neversink, Beaverkill and Willowemoc. The State does a fine job in providing us with public fishing areas and in stocking the streams with fish.

Sometimes, however, I wish I didn't love the outdoors and fishing so much. Quite often, while I'm enjoying the great outdoors I see people thoughtlessly destroying one of the greatest things we have. In many towns I see people who live along our streams, throw their garbage along the banks. Although there are signs put up by the Conservation Department cautioning against this practice these warnings are unfortunately usually ignored.

I believe one of the reasons for this deplorable situation is due to the laxity of our laws. The garbage collections in many of these towns are not carried out by the local government. Thus, these people who throw their garbage into the stream use this method of disposing of their garbage in preference to paying a private company to collect their garbage.

Perhaps a small increase in taxes in these communities will enable the local government to collect the garbage and alleviate this pitiful situation.

I realize that raising taxes at this time does not agree with public opinion which favors a decrease in taxes. However, a tax increase is the lesser of the two evils.

Sure a tax for collecting garbage to keep our communities clean and preserving the wonders of nature will be beneficial to most of us. After all, cleanliness is next to Godliness.

Murray Gruber, Bronx

• *Something can—and is—being done. See page 9 this issue.—Editor*

Seneca solution?

Dear Sirs: I have read with much interest your article in the October-November issue entitled "Live Trapping White Tailed Deer." I read it with interest because I believe I have a very practical solution to the over-population of deer on the Army Ordnance Reservation.

It seems almost naive to mention it yet I do believe it would work. Here it is: Grant special license and permit to bow hunters with proper clearance, etc. to hunt within the limits of the Seneca Depot.

The advantages would be: 1 The deer population would be diminished considerably by the activity of bow hunters; 2 the danger of exploding stores of ammunition would be nil; 3 bow hunting enthusiasts would have excellent experience and practice in rendering a service both to the Army Depot and Conservation Department with reference to deer over-population.

Yours for better bow hunting and control of the deer population.

Rev. Charles F. Schwartz, Brooklyn

• *We'll keep tuned in for the Army's reaction.—Editor*

License fees

Dear Sir: In the February-March CONSERVATIONIST, question 8 of "Letters to the Editor" suggested the lowering of prices for hunting licenses, or any other license. If anything, the price should be raised to at least $5 for hunting and fishing and raise the other fees accordingly. The person who wrote the letter seemed to be interested in the archery fees especially. If he can afford the sport of archery he can certainly afford the license.

With prices of sporting equipment the way it is today, the license is of the smallest price and still would be with the price increase. If you are going to ask for a price change some time in the future, it should be for an increase to help support the Conservation Department. If the person belongs to a sportsmen's club the fees and banquets probably cost more than any license.

Jake Kukella, Auburn

• *License fees amount to approximately 1¢ for each dollar spent by fishermen; four cents for each dollar spent by hunters in New York each year—according to the Crossley Survey.—Editor*

French "Patois"

Dear Sir: I have read with interest and some amusement a letter you published in the February-March issue of THE CONSERVATIONIST, written by Mrs. Alban Mazeau of Garden City.

She apparently resents my use of French Canadian "Patois" in the verses I wrote entitled "De Huntin Season" which you published last Fall in your fine magazine.

She says: "Altogether the sender and his article are stupid. I was born in French Canada and I know very well that if there are people over there who do not speak a foreign language perfectly well there are others and a great majority of them who speak it perhaps much better than some ignoramus from Boston."

I wonder if this lady ever heard of the world-famous French Canadian Patois poems written by Dr. William Henry Drummond, who as a physician spent the major portion of his life in ministering to the medical needs of the humble French Canadian inhabitants in the Province of Quebec. As a relaxation from his arduous duties he wrote Patois poems that his friends persuaded him should be published. His three books, "The Habitant," "The Voyageur," and "Johnny Courteau," were all best sellers in Canada, the United States and England. In fact the popularity and merit of his Patois poems created such an interest here and abroad that five years after his untimely death in 1907 George P. Putnam Sons published a collection of his poems which went through three editions and sold over one hundred thousand copies.

Here is an excerpt from one of Dr. Drummond's poems that is a favorite of mine—the title: "LEETLE BATISTE":

"You bad leetle boy! Not much you care
How busy you keepin your old Granpere
Chasin de hen aroun de hay!
Why don you geeve dem a chance to lay?
Leetle Batiste.

"Of on de field you follow de plow,
Den wen you tired you chase de cow,
Sicken de dog till she jomp de wall
So de milk she ain good for nutting at all
An you only five and a half dis fall,
Leetle Batiste - - -."

I agree with Mrs. Mazeau that the "majority" of French Canadians speak perfect English. Through my academic associations over the past fifty years I have met and enjoyed contacts and friendship with many educated French Canadians, and have always had the highest respect for that important segment of Canada's population who have contributed so much to that country's remarkable growth and development.

I make no claim for any poetic genius. For the amusement of my family and friends I have written many verses using this Patois terminology. I became fascinated and familiar with this quaint terminology in my younger days when hunting big game in northern Quebec.

In closing I would like to say that since you published my verses on "De Huntin Season" I have received numerous appreciative and congratulatory letters from woods lovers, both male and female, residents of New York State, New Jersey, Connecticut and Massachusetts. The letter sent you is the only one I have read that takes me to task for my effort.

The "Ignoramus from Boston,"
E. Ray Speare, Ph.B., D.B.A., LL.D.,
Boston, Mass.

Tough bass

Dear Sir: In the December-January issue of THE CONSERVATIONIST you answered a letter from Freda Vandenburg of Northville relating to a newspaper clipping stating that a smallmouth bass caught in Minnesota had swallowed a mink weighing nearly one pound. She states that it is "hard to believe" and it has happened at least twice.

Last Summer in nearby Chautauqua Lake, the following incident took place (as near as I can remember). An angler from Salamanca landed a smallmouth bass weighing about 6 pounds. While cleaning the fish he found a mink (weight unknown, but probably a young one born that Spring) in the stomach, not yet digested.

This article appeared in the Salamanca press sometime in July or August but unfortunately I do not have a clipping.

As you said, a mink is a "rather vicious individual" and must have clawed like a wildcat on the way down. This also proves that New York bass are just as tough as Minnesota bass.

Bill Armstrong, P.-R. Foreman,
Div. Fish and Game Great Valley

Squirrels and tulips

Dear Sir: I have just read with interest Mr. Hamilton's article, "The Squirrels of New York," and, as always, have enjoyed Mr. Trimm's accompanying illustrations in the February-March issue. However, my interest and pleasure were diminished by the sight of live specimens busily working in my garden.

As a city dweller (and right in the heart of the city, too), I am prevented from handling my problem directly by means of a gun as I used to do down home in Louisiana. Therefore, I am requesting your help (less forceful but equally effective, I hope) with the problem of keeping them out of my flower beds. From late Summer through the Autumn, they dig up the beds while burying nuts—horse chestnuts which they don't eat anyhow, and acorns). And they simultaneously extend their labors to include the bulbs which I have planted. The latter seems to be sheer curiosity as they inspect the bulb, then leave it lying on the ground next to the deep hole they have just excavated. If I replace it, they simply repeat the procedure. It is definitely possible to plant a bulb up to six times before they tire. As Spring approaches (right now to be exact), they begin digging again, frequently uprooting bulbs and plants. When the bulbs have sprouted and are well above ground, they eat the leaves of some types, await the blooms on others. Last Spring they waited for each tulip to develop a bloom bud and, just as it was ready to open, they neatly whacked it off, devoured it on the spot, leaving a bare stem standing. In addition, they ate the young, newly-sprouted leaves on the day lilies as well as the madonna lilies fairly consistently, with occasional hors d'oeuvres of daffodil leaves. I tried placing both moth balls and flakes around the plants, which intimidated them for a few days. Then they simply pushed them aside, continued digging and eating. This year I have tied several ears of Indian corn to the fence, with the hope of sidetracking them to another edible. However, they seem to view this only as an extension of their diet and not as a substitute. As I wash the dirty dishes, we eye each other across the remains of the corn or across another of their excavations. My garden already begins to look as if I kept a batch of hunting dogs, and the snow isn't off the ground yet.

I would appreciate any suggestions.

Mrs. Warren Winkelstein, Jr., Buffalo

• *The Conservation Law was this year amended to add gray squirrels to the list of species that may be destroyed, without permit from the Conservation Department, when they are damaging property. Now all that's needed is the blessings of the city fathers to eye those squirrels over the barrel of your Louisiana rifle.—Editor*

Winter traveller

Dear Editor: While fishing in Lake Champlain for smelt, north of Plattsburgh, I saw a very unusual thing.

We were fishing in water a hundred feet deep and about three hundred feet from shore. About sixty-five shanties were on the ice, which was over a foot thick, with the smelt biting fairly good. With a lot of yelling and racket behind me in the next shanty, I turned around and there were two fellows trying to hold a large muskrat which had come up through the hole. This was the second one caught this week.

Could you explain how a muskrat could be that far under water and so far from shore.

Elliott Wyman, Morrisonville

• *Muskrats often make under-ice excursions, making use of the small bubbles of air trapped just below the surface of the ice.—Editor*

Piebald deer

Dear Sir: While looking through some old family pictures, I came across this interesting card. It is of a part-albino buck with an exceptionally fine rack. The deer is stuffed and mounted on a wooden platform. Without horns and hooves, he would probably pass for a Dalmatian dog.

Bert Vonderake, Gloversville

Bee boxes

Dear Sir: A few years ago I made three wood duck nesting boxes along the lines suggested in the Reprint No. 126 from THE CONSERVATIONIST. The first year the boxes were subject to predation by local small boys and the employees of the Mosquito Control Commission. So I moved the boxes from poles which I had placed in the center of a wooded stream to some large trees which were a few feet away from the stream. Then, when I examined them after they had been in place for a full season, I discovered that all the boxes were occupied by wild bees. Do you have any suggestions as to how I might discourage the bees?

Eugene T. Mudge, Northport

• *Sorry, no. In our arguments with bees, we've been a consistent loser.—Editor*

Egrets

Dear Sir: Last Fall for two weeks we saw and watched through field glasses four white birds, which we believed to be American Egrets. We understand that they are rare and thought perhaps you would be interested to know. They were located in a bay just north of the North American Cement Plant. This is south of the Village of Catskill. Locally the bay is called The Embocht Bay. They were apparently feeding on small frogs which live along the edge of the shore. At times they had been seen roosting or sitting in low trees. Between the bay and the Hudson River proper is a bar and they walked around that on both the river and the bay side. We would be interested to know for sure if they are egrets and how long they can be expected to stay or do they migrate? They have yellow bills and darkish legs and when they fly their tails fan out behind them.

We have been readers of your fine magazine for several years and always find something of interest in every issue. We always enjoy Clayt Seagears' paintings and articles.

Amy M. Powell, Catskill

• *You are correct in believing the white birds to be American Egrets. During the post-nesting season the young of the year and some of the adults go on tour and may wander as far north as New York State or southern Ontario. With the increase of these birds on the nesting grounds, the appearance of them in this State during the Summer has become a fairly regular occurrence, although the numbers may vary from year to year. Sometimes they are so numerous that it seems every pond and ditch has one or more in it and at other times only a few show up. Last year was a moderately lean year.—Wayne Trimm*

Nessmunk is Nessmuk

Dear Sir: In the February-March, 1957 CONSERVATIONIST, Page 36, there is a heading "Nessmunk Again," showing two-type clinker built canoe. Then you again say "Nessmunk"-type guide-boat.

I have in my possession from the *Field and Stream* library, a book entitled "Woodcraft," by Nessmuk. It was published in 1900 and was the twelfth edition. This great woodsman's picture adorns the front page and his autograph is underneath—writ in his own hand—and is spelled as I have it above, and who's real name was George W. Sears. I am enclosing a poem by this same man:—

"For brick and motor breed filth and crime,
With a pulse of evil that throbs and beats.
And men are withered before their prime
By the curse paved in with the lanes and streets.

"And lungs are poisoned and shoulders bowed.
In the smothering reek of mill and mine:
And death stalks in on the struggling crowd—
But he shuns the shadow of oak and pine."
Nessmuk"

If this is the same person you have reference to, please correct the spelling of his name.

Vincent Connavale, Boothwyn, Pa.

• *Nessmuk is correct.—Editor*

Metasequoia

Dear Sirs: Regarding the article on Sequoia Trees, a few months back, I have what is known as a Metasequoia about 20 feet high on my place. It was given me as a small seedling about six years ago by the Brooklyn Botanic Gardens and was then about three inches tall. They told me this variety came from China, way in the interior where there were a grove of these trees surrounding a Buddhist temple.

The Brooklyn Botanic Gardens people told me that this Chinese temple variety was the only other spot in the world other than California where these big trees grow.

Gilbert E. Pohl, Great Neck

• *You are fortunate to have one of these as the number which have been propagated here in North America since the discovery of this species in China some years ago is probably rather limited.*

If you will refer to the NEW YORK STATE CONSERVATIONIST, *the June-July, 1950 issue, you will find an article on page 22 under the title of "On Borrowed Time" which discusses Metasequoia and two other species which may well have become extinct had they been perpetuated through cultivation.—E. W. Littlefield, Asst. Director, Lands and Forests*

Deer antlers

Dear Sir: For some time now there has been a general discussion and at times an argument, between myself and about 19 other guys here on the base. I am writing to you for verification on the following: I am under the impression that it is commonly thought by most people that all deer (in the U. S.) lose their rack once a year. The 19 guys I have been arguing with say that bucks don't lose their racks every year and believe it is every 3 or 4 years. I like playing the role of underdog (odds are 19 to 1 against me). Especially when I sincerely believe I am right. Of the guys that I am arguing with, none of them have ever found a shedded rack in the bush. They are from different parts of the country and thus have all hunted in different type of terrain. I am from the State of Washington and in my knocking around have run across numerous deer racks that have been shedded. Now then, do all bucks shed their rack and how often? Also, what becomes of the racks after they are shed and why is it that these other fellows here have never run across a rack. (I know why but I would like to have you give me an answer so they will believe me).

Ron Solheim, Lockport A. F. Station

• *Normal buck deer do lose their antlers once each year. In this section this occurs during the Winter months so that the shed antler often goes unseen under the snow. By Spring most of the antlers are eaten by the gnawing rodents such as mice, voles, and by porcupines so there is nothing left to see when the snow does go. New antlers are grown during the Summer and are covered with "velvet." In the early Fall growth is complete and the antler becomes essentially dead and loses its sensitivity. The velvet is rubbed off on small trees and the antlers get that hard polished look that we think of in connection with buck deer.—Wayne Trimm*

Tree planting

Gentlemen: As co-owner of an abandoned farm of some 180 acres in Schoharie County, (in Huntersland to be exact) and as an absentee landowner, I wonder about the possibility of reforesting my land as a conservation measure. The land is suitable, this much I do know, and since I only use it for vacations of one or two weeks a year and an occasional week end, it seems a shame to just let it lie uselessly. I have heard from friends that I can secure trees from your Department. If this is true, please advise me as to cost, etc. and planting time. If not, can you give me some information about replanting my land in trees (type available, survival in this area, etc.).

George Van Hecke, Westfield, N. J.

• *Essentially the facts are as follows: The State Conservation Department does grow some 30 million trees annually mostly for distribution to private landowners. These trees are generally two or three-year seedlings for which there is a charge of from $2 to $3.50 per M trees. Generally, most of the available trees are shipped in the Spring (April through May).*

Planting is accomplished by laborers using a grub hoe, or by contract planters, some of whom plant by machine. Current planting costs vary from $18 to $21 per M trees. Any individual may apply to his County Agricultural Conservation Practice office (in your case, located at Cobleskill) for Federal aid which will pay within certain limitations $10 an acre for a successful planting.

Species available are white, red and Scotch pine, white and Norway spruce, larch and limited amounts of Balsam and Douglas fir.

Tree survivals are dependent on the quality of the planting job, and a favorable season. Generally, for all species it should be 80 per cent or better. Spacing of trees (that is number per acre) is also dependent on the species to be planted.

Unfortunately our supply of available trees this year has been exhausted, and our next supply will not be available until the Spring of 1958. If you would request an order blank from us in August or September of this year, we would be glad to assist you in starting your program.

If there is any question about the success of such plantings, I suggest you look over some of the plantings made in the early 1930's in the vicinity of Blenheim and West Fulton located on several of our State Forests. Also please feel free to call on this office for assistance. We will be glad to examine your property at some time convenient to you, and will aid you in making specific recommendations for the land in question.—R. Milton Hick, District Forester

A bundle of fur and ears

Gentlemen: I have just read with great interest the article on the European Hare by Mr. Joseph Dell in the February-March issue of THE CONSERVATIONIST.

I think that I have derived more pleasure and disillusionment hunting this rascal perhaps more than anyone else, because I have been hunting them for 50 years; 10 in Italy and 40 years in the United States.

For any hunter seeking a real rugged sport, the Hare can furnish it. If you hunt them in 6 to 10 inches of snow with the temperature ranging from 0 to 20 degrees above, and if the wind is sweeping the hills at 30 m.p.h. and you stick it out all day, you've passed the test. Of course, this is done without the aid of dogs. You track and jump them yourself.

Nine out of ten times they will jump in back of you while you are following a track purposely made to lead you away from where they sit. If, however, there is a chance that one might jump in front of you, you are too numb and your eyes full of tears from the cold to take careful aim. It takes just a few seconds for that bundle of fur and ears to tear across the fields at better than 40 m.p.h.

However, if you have a partner willing to remain still until he turns blue from the cold, you might bring one back. They will eventually circle back after perhaps circling a mountain first and following previously made tracks or hitting roads, etc. If you do jump one alone and don't get him with the first one or two shots, wish him good traveling—you'll never get closer to him than 300 yards.

I disagree with Mr. Dell for he places them second to the cottontail. I think they are more delicious but you have to dress them before they cool off—just as you would with a deer.

Ettore Neri, Bronx

NOTICE

You are welcome to HUNT here if you inquire at house for permission

signed: W. F. FAY

Landowner-Sportsman

Dear Sir: Under separate cover, I am sending you a copy of my "special print" posted signs.

After hunting for 28 years and being a landowner myself, I've tried to look at this posted land problem from both angles and after using this sign for the past two hunting seasons I am convinced that the problem can be quite easily solved if both landowner and hunter take a little time and consider each other's position.

Three years ago this past hunting season, my family was forced into the house because of irresponsible hunters shooting at birds regardless of the direction of fire. After my years of hunting experience I contend that the majority of hunters will ask for permission to hunt on property if they have half an idea that permission will be granted. I've been turned down just once and a great deal of my hunting has been on posted land with permission given gladly in the majority of cases.

The property owners in most cases, just want to let the hunter know of a certain corner that he has just seeded, has a few head of young stock, etc. And, the property owner likes to feel that he still has a little say as to who shall and who shall not have the run of his property.

Quite a few hunters have stopped for a few minutes to ask permission to hunt which is always given. But there are not as many hunters hunting my property as there were in previous years. But, by the same token there hasn't been any careless shooting, no property damage and the wife and children do not hesitate in enjoying the backyard during the Fall.

It could be that the hunters that aren't hunting my property as dangerously as they did before, are the same hunters that couldn't spend an extra few minutes to stop at the house and let us know that they wished to hunt.

I believe this also proves another of my contentions—that a hunter is more careful and thoughtful if he knows that the property owner knows of his whereabouts.

Wilbur F. Fay, Fulton

• *A most reasonable position.—Editor*

The gray and the white

Dear Sir: In response to your article "The Squirrels of New York," February-March, 1957, I have something that may be of interest.

On the second day of squirrel season in 1952, a friend of mine while hunting for gray squirrels in a wooded area around Mt. Morris, shot an albino squirrel. It is a gray squirrel in a pure white phase and had pink eyes. He has this squirrel mounted.

How often do these squirrels occur, or are they a rarity?

Paul Spindler, Rochester

• *I have seen only one albino gray squirrel in New York and never an albino red squirrel. My guess is the proportion of albino grays is about what we find among woodchucks: one to 4,000-5,000 of the natural colored ones. In the parks of Washington, D. C. albino gray squirrels are fairly common, but there we find few natural enemies. A white squirrel would more likely be taken by a predator than a gray, hence have a lesser chance for survival.—W. J. Hamilton, Jr., Professor of Zoology, Cornell University*

Friends

Dear Conservationist Department: I'm wondering what I can do for the Conservation Department?

I'm ten years old and I'm *not* looking for a job, but I think that we could be friends.

Alan Miller, Vestal

• *We think so, too. (We suggested that Alan might help most through membership in a local Boy Scout Troop. They are building a better conservation program each year.)—Editor*

Rat on a raft

Gentlemen: Here is a picture which may be of interest to you. One of the barrels on this dock filled with water and dropped the floor to the water level. The muskrat spent all Fall building this den but he forgot to put in a "back door" in order to get in and out of the water. When the lake froze he found he was high and dry so left for parts unknown. This dock is on the property of Bernard A. Barton at Brant Lake.

Mrs. Edith B. Clifford, Brant Lake

DDT

Dear Sir: I have read the June-July, 1956 issue of THE CONSERVATIONIST and question the accuracy and intent of the articles "Paradise at Paradox" and "The Gypsy Moth."

In "Paradise at Paradox" it is stated that "it was not—and is not—the intention of the State to use the information gained as the basis for promotion of new blackfly control programs." If that is true, then why spend several pages presenting details and testimonials as to the results? It must be the intent of someone to present publicity of this kind so as to create a demand for control programs all over the State. If it is not the intent of the State, then how do State funds get spent furthering such ideas?

In the preface to this article it is stated that the use of DDT is for professionals and not amateurs. Yet in the June-July, 1955 issue you published exact methods of preparing DDT blocks for stream treatment. As a chemist I was very disturbed to see such a disclosure. Irresponsible amateurs could easily feel they should use an extra block more than recommended "for good measure" and cause a serious fish and insect kill. This tendency is noted by Mr. P. Springer in his articles "Insecticides—Boon or Bane?" in the June and July ['56] issues of *Audubon* magazine. Mr. Springer, a biologist with the U. S. Fish and Wildlife Service, points out that those insects which survive initial DDT treatments soon propagate generations of insects which can withstand 1,000 times larger doses. What assurance is there that the blackfly will not become DDT-resistant just as house flies, mosquitoes and others have? Although this first trial in the Paradox area was at low DDT concentrations and reportedly without effect on other wildlife, there is no data or evidence as to what future measures may be required to kill blackflies. Conclusions that this experiment was a success are premature and decidedly inaccurate in view of the mass of evidence that insects rapidly develop "insecticide resistance" *in varying degrees.* It is entirely possible that blackflies could become resistant and mayflies, etc. exterminated by increasing doses of DDT. This should be considered a main point until proven otherwise.

At one point in the article the use of emulsified DDT is described. The impression is given that only blackflies are killed because they are on the tops of the rocks while most of the flies that fish eat are safe under the rocks. I have seen the tops of rocks covered with stone caddis and stick caddis nymphs and in many streams they are a most plentiful source of fish food. Since the density of a chlorinated insecticide like DDT is greater than water, it would certainly settle to the bottom and contact insects under the rocks. I feel the article is definitely in error on these two points.

In a study of Idaho streams treated with DDT, fish and their insect food were at a low level as much as two years later. In view of this and many other known examples of the adverse effects of DDT on fish and insect life, I suggest that such treatments be stopped or severely limited until: (1) An insecticide is found which will kill blackflies specifically and not insects trout and other game feed on; (2) the relative resistance of successive generations of blackflies to DDT is determined; and (3) the ratio of blackflies versus mayflies, etc. killed is determined.

Since the State spends considerable money to obtain public fishing rights on streams and more money to stock them, it seems that it is the duty of the Conservation Department to protect *that* investment and not the investment of various resort owners.

In the article "The Gypsy Moth" in the same issue the Conservation Department has apparently given blessing to widespread aerial DDT spraying operations at a rate up to 1 pound per acre. Such treatment in Pennsylvania killed 70-90 per cent of all stream insects within three days. In another instance an oil solution of DDT sprayed by plane at a rate of ¼ pound per acre killed 90 per cent of the total insect population and apparently exterminated one-third of the species studied. These included 15 species of Ephemeroptera, 10 species of caddis flies, and 5 species of stone flies.

Trout can be restocked at a moderate cost but insects cannot. Loss of insect life in most of our streams due to silting, drought, and poor water regulation has decreased the number of fish which can be supported. In view of the annual increase in fishing pressure we should do everything possible to maintain and increase stream insect life. It certainly is the duty and responsibility of the Conservation Department *not* to allow the U.S.D.A. or anyone else to spray DDT in a concentration *proven* deadly to trout and their insect food supply. A fish killed by lack of food is just as dead as one killed directly by DDT.

Since you have stated that it is a violation of the Conservation Law to kill fish through use of DDT, I would be interested to know what steps have been taken to prosecute the U.S.D.A. or any other agency responsible for a fish kill. Will the Conservation Department have a team of entomologists and biologists in the areas to be treated to check the effects on fish and insect life? Extermination of insect species which are fish food is too high a price to pay for what is claimed at best only "effective control," not elimination of the moth.

Articles published in scientific journals directly contradict the methods proposed for the gypsy moth program. I am sure the Conservation Department would receive support from many sources in insisting on safer and better controlled insecticide treatment programs. Why not publish this in an early issue and find out? I will be glad to furnish any literature references necessary.

Minert E. Hull, Kenmore

• *The purpose of the Paradox Lake blackfly control tests may, perhaps, be better understood if we consider a little more of the background than could be presented in a short popular article.*

Blackflies in many parts of the world carry serious disease organisms that cause much human misery including blindness. In other parts of the world, such as in northern Canada and Alaska blackflies are such vicious pests that they seriously curtail essential industrial operations such as mining and lumbering, important national defense projects, and the activities of military personnel. In still other areas, e.g., central Europe and western Canada, blackflies kill livestock.

In view of the widespread misery and destruction of life caused by blackflies, it would be surprising indeed if no efforts were made to control them. In some of the areas mentioned, the problem is so serious that the inhabitants are willing to use any practical method of killing blackflies regardless of the effects on other living organisms. We in this State, including the State departments involved, together with you and others interested in wildlife and conservation, would be most unwilling to have such indiscriminate methods used in New York. Yet that was just what might have happened had we not undertaken studies which have led to the formulation of restricted, controlled, and safe methods.

For instance, the plaster block method had been used in Guatemala and in Quebec. The news of this method spread down from Quebec and it was used in New York by local groups before we had a chance to study it and work out safe dosages. We were continually receiving inquiries about this and other control methods. It was apparent that blackfly control would be practiced by uninformed persons with no background in either entomology or conservation unless some State agency should undertake the research necessary to develop safe methods, and to acquire the information needed for New York State conditions.

The New York State Science Service was created by an act of the Legislature which stipulated that one of its duties was to furnish other State and local governmental agencies with information on problems that

arose within the fields of knowledge in which it operated, and that when such knowledge was lacking it was to undertake the research needed to furnish the desired information.

Therefore, and partly in order to guard against the very abuses which you fear, the research on blackflies and their control, which actually began many years ago, was renewed. Since the Conservation Department administers public lands, including State campsites, and was receiving increasing numbers of demands for insect control of various types, it was desirable for them to make their own evaluation of the program, using methods which had proven safe and successful elsewhere. The Paradox Lake program was undertaken as such a test.

Now, to revert to the specific points and inquiries in your letter, in which the "accuracy and intent" of the Paradox article are questioned. Certainly there could be no conceivable reason for presenting anything but the actual facts of the operation. They are all a matter of record, and numerical tabulations of the insects in many streams both before and after similar treatments are given in New York State Museum Bulletin 350, which is cited in the Paradox article. The purpose or intent of the article is clearly stated in the concluding part of the statement of which you quoted a portion; namely, to test the feasibility of such a program, and, we might add, to test once more its safety. You may rest assured that had it not been successful and safe, the Conservation Department and our office would have stated as much unequivocally, and would have taken steps to modify the methods, or restrict them altogether. Indeed, it is only on the basis of such tests that legislation, if needed, can be based.

You state that as a chemist you were disturbed at the "disclosure" of how to prepare the plaster blocks. But were you aware that people were already, in other regions, using far more dangerous methods? Except for airplane spraying with the extremely small doses required, the plaster block method is the safest that we have studied, and it seemed far better to acquaint the public with the safest method than to have other methods used in a hit or miss fashion, knowing that some method is bound to be used anyway.

Even if the "irresponsible amateurs" whom you mention do use an extra block now and then, the margin of safety is so much greater than with some other methods that little if any harm would result, whereas with other methods, overdosing would be much more likely to occur, and to cause harm.

In planning and executing our experiments, and in advising on control programs, we have kept in mind the points brought out in Mr. Springer's excellent article, which you have mentioned. Most, if not all of the work cited in that and similar articles, where damage has been done, has involved the use of much higher dosages than we use, or has been part of an experimental program which was dropped when its effects were observed.

Those who are concerned about the possibility that blackflies may become DDT-resistant, and who cite house flies as an example of an insect that under some conditions has become resistant, overlook the fact that with house flies one is dealing with a population that has many generations a year and where close inbreeding among surviving, i.e., presumably more resistant individuals, is likely to occur. With blackflies an entirely different type of life history is involved. Furthermore, since control is confined to limited areas, the populations are presumably largely continued by flies coming in from uncontrolled areas. Therefore it would not be expected that resistance would develop in blackflies as it has in the house flies.

One can easily imagine that resistance would develop just as logically in mayflies, which would then survive in increasing numbers while the blackflies were exterminated, rather than the other way around. I quite agree that the subject of resistance deserves further study; that is one reason why the research on the problem is being continued.

Another point I should like to make is that the extremely small amounts of DDT that are required to dislodge blackfly larvae are not necessarily large enough to kill them outright, but merely enough to make them let go from their exposed position and affect them only enough so that they cannot reattach. Insects not similarly exposed would not be similarly affected. Another reason why blackfly larvae can be affected by doses that would not affect many other insects is the way they feed. Blackfly larvae are stationary, passive feeders, equipped with constantly moving mouth brushes which create currents that engulf any particles worked into their orbit, whereas insects like immature dragonflies and mayflies are active, aggressive pursuers of specific, selected articles of food.

I hope that the above remarks on blackfly research and control, being based on first-hand experience and close contact with the work in all its phases, will convince you that we are paying close attention to the points which cause you concern. These are the very points which have caused us concern, too, and have been among the points to which we have given the most attention.

As for the gypsy moth spraying, great care is exercised by the Conservation Department to prevent contamination of streams, ponds and lakes.

Probably many more fish and fish food organisms are killed by poor water regulations, and other mechanical operations, such as blasting and road-building activities, than by spraying—a fact which you recognize in your letter. Fish can be restocked, as you observe, and I should like to add that population pressure also results in natural restocking of streams with insects in a remarkably short time. The statement that "everything possible should be done to maintain and increase stream insect life" if left unmodified would certainly be challenged by the vast number of people who are subject to attack by blackflies, mosquitoes, punkies, deerflies and horse flies, the early stages of which are aquatic or semi-aquatic, especially since these pestiferous insects can be virtually eliminated without eliminating most other insect fish food.

Further, it has been established that trout are opportunists as far as feeding is concerned. If one type of insect, such as blackflies, disappears, the fish will feed increasingly on other insects, both those that are aquatic and those that fall into the water.

Even if certain types of stream life were to be temporarily diminished by gypsy moth or other forest pest control operations designed to save trees and forests in isolated areas, may I leave with you the thought that Nature may repopulate a stream within a year or two either with or without the aid of man, but it takes that same Nature a hundred years to produce a full grown tree or a mature forest, and there is not much man can do to help, except to discourage fire, insects and disease.—Donald L. Collins, State Entomologist

Last fight

Dear Editor: While rabbit hunting last January my companion, Bob Straight, of Jay, found the carcasses of two bucks that had become locked together in combat and died that way. The larger of the two was a 13-pointer and the other an 8-pointer. Because of the extreme cold here in Jay the past few weeks they were very well preserved except where the bobcats had worked them.

I have turned these deer over to District Game Manager Greenleaf Chase at Ray Brook and I assume the horns will be kept there.

Gilbert Manley,
Forest Ranger, Jay

• *The male animal never seems to learn.—Editor*

Pepperidge

Dear Sir: In a recent talk with an old time lumberman, O. F. Howland, of Bainbridge, the name of the tree called Pepperidge was mentioned by him. He said that he had cut and sawed several of these trees during his years as a lumberman but otherwise knew very little about them.

Claude Terry, Jr., Bainbridge

• *"Pepperidge" a name applied locally to the Tupelo or Black Gum, also called Black Tupelo in the current nomenclature of the U. S. Forest Service. The scientific name for the tree is* Nyssa Sylvatica.

It is essentially a southern tree, but its range does extend into New York and New England. It is quite common in the lower Hudson Valley and extends, to my personal knowledge, as far north as the central part of Saratoga County, where it grows in some abundance in a large swamp in the Town of Greenfield. It appears again as a fairly common tree in the Oneida Lake basin, but tends to disappear north of the two localities mentioned.

As you infer, the "old timers" made some use of Pepperidge where they wanted an extremely hard wood which would stand a lot of punishment. I understand it was used for tool handles and particularly for maul heads. There is a colorful description of the use of this wood in pioneer days in Peattie's "Natural History of Trees."—E. W. Littlefield, Asst. Director, Lands and Forests

Deer problem—continued

Dear Sir: After reading and studying the "Winterkill of Deer 1955-56," on page 11 of THE CONSERVATIONIST, (Aug.-Sept.) I think something should be done and it seems possible with the help of local game officers and sportsmen.

Everyone can see from the report that there are a certain few counties where the situation is really serious. In these counties it is undoubtedly the hard, back-breaking work of clubs who help keep the deer alive through the Winters. Therefore I think it would be possible to reward these sportsmen with the right to take two—yes, two—deer, a buck and a doe, during the regular open season but only in the counties where the herd needs thinning.

Since I am not directly or indirectly affected by any such movement, may I suggest that only county residents and sportsmen's club members even be considered for such a program? Special hunting permits or licenses with a fee should be issued only by Game Protectors at regular sportsmen's club meetings, and with even a little help from the club members the amount of "wasted natural resources" of our State could be partially eliminated.

Alan R. Schweigert, Newfane

• *It obviously is as apparent to you as it is to this Department, that the proper management of the deer herd in New York with the attendant problems of agricultural crop damage in some areas of the State, and actual deer starvation in other areas, is one of our primary headaches. On the other hand, the deer herd is recognized as a tremendous natural resource and certainly is deserving of the best thought that can be applied to bring about a solution.*

Fortunately, and I think on this point all well-informed sportsmen will concur—we have here in New York, some of the best qualified game men in the country working on the job. Moreover, we are fortunate in having an increasingly better informed corps of sportsmen throughout New York that are aware of the difficulties involved in the proper management of this resource and—as in your case—very obviously thinking about solutions.

I think it is safe to say that there will have to be some new licensing procedures worked out in the future not only to assure the continued adequate harvest of the annual surplus of deer but also to safeguard the property rights of landowners on private lands in New York which now, and in the future, will support the bulk of the herd.

Your suggestions along this line certainly come under the heading of possibilities and I am sure that Bill Severinghaus and others in the Bureau of Game responsible for working out solutions to the licensing and harvest problems will be interested in your ideas. I think it's appropriate to add though that any measures that may be taken in the future will have to be based on a completely equitable consideration, and I am afraid that singling out sportsmen's club members, as eligibles for special consideration, would be looked upon as a preferential and biased approach and would be open to widespread criticism by non-affiliated licensees who, unfortunately, are in the great majority. Not only that, I am sure that it would be held to be unconstitutional or as catering to a minority group.—Editor

About bites

Gentlemen: May I attempt to give some information on two subjects that have been discussed in your valuable magazine?

First, the subject of chiggers (red bug, jigger, etc.). Having been a member of the Infantry (NYNG and RA) for over forty years I have had my troubles with these pests particularly crawling over the chigger infested lands of Georgia and Louisiana. To lessen the annoyance of chigger bites, rub powdered sulphur on legs, ankles, body up to the waist and under arm pits before putting on clothes prior to entering chigger-infested country. If bites are found, dampen a piece of cotton with Chlorox and rub over bites. Repeat until infection disappears.

The other was relative to feeding fish in a small pond. I have used the following method to feed both trout and bass: Obtain from a slaughterhouse the head of a calf, cow, etc., and wrap the head in a piece of chicken wire with small mesh (about ½ to 1 inch). Suspend this by a pole pushed into the pond bottom at an angle so that the wire enclosed head hangs from 2 to 6 inches above the surface of the water. The head will attract flies and the flies and maggots will furnish food for growing fish. Not recommended if pond is close to the house unless bait can be placed far enough away.

Col. Wm. Hones, Mathews Co., Va.

Butter crabs

Gentlemen: I would like to know if you could tell me if there is such a thing as "butter crabs" for fishing? And, if there is, I would like to know where we could buy them.

I heard two men talking on the bus the other night as I was coming home from work and they said they had a lot of good luck fishing with butter crabs.

William R. Zech, Utica

• *Another name for the "soft-shelled crab"; a growth stage following the shedding of the crayfish's shell, before the new and larger shell has had time to harden. Bait dealers in your locality may be able to supply them. —Editor*

Double catch

Dear Sirs: I have been thumbing through some old books and came across an article in your August-September, 1956 issue where a couple of fellows were telling about catching two foxes in one trap at the same time.

Well, I never did that in all the foxes I have taken but I'd like to tell you what I did have happen that I thought was very odd indeed. I had one set for mink at the foot of an old stump along a spring brook in which it took two traps to cover the set properly. My second trip over the set really got me, as when I arrived one trap held a very large mink and the other held a very large muskrat. Both were very much alive and within inches of each other. The very odd part about it was that the 'rat had been caught last as it had snowed after the mink had gotten caught and the tracks of the 'rat were plain from the brook to the set.

Maybe you can explain. I cannot.

J. R. Schoonmaker, Monticello

• *The situation you describe is not too uncommon. I am surprised though that both the mink and 'rat were alive. It is my belief from watching several 'rat and mink fights that 'rats attack mink as often as mink attack 'rats.*

Have seen 'rats, usually big ones, chase mink several times and often had mink bitten and stamped almost flat by 'rats when the mink was caught in a trap.

I know of several other trappers who have had the same experience.—Edward R. Maunton

Panthers and pancakes

Dear Sir: I am absolutely certain that panthers exist in the Adirondack Mountains. Black ones, with luminous green eyes that glow in the dark.

The reason I am sure is that in August of 1910, Mr. Willis Wood, who still maintains his camp on the Upper Au Sable Lake, invited me and some other young children to spend a night there. His guide took us in and cooked for us. Wonderful Adirondack pancakes smeared with soft maple sugar. After supper this guide, whose name escapes me, told us stories of his adventures in the wilderness in the lonely Winter. Once he was caught in a heavy snow right at

this very camp. He built a big fire and sat close. A huge panther stalked him, screaming all night. Only by throwing fire brands at the green eyes could he keep the beast at a distance. Just as dawn broke he ran out of fire brands but the panther slunk away with the coming of daylight, leaving a beaten path of footprints in a circle all around him.

I shivered in fear all night—looking for the eyes and waiting for the scream. It just happened that the panther wasn't there that night but I know the story is true.

Mabon Kingsley, New York City

Worse and worse

Dear Editor: Panther stories never end, they get worse and worse. This is an actual hunt in Rensselaer County a few years ago. While hurrying some patching plaster into its respective places one April morning the 'phone rang and I was requested to aid in annihilating a mountain lion that had entered a brush and grass patch about an acre in area. On arrival, the men spread out to hunt.

Penetrating a few yards into the brush I was warned by a lusty shout, "Look out he's coming your way!" I could see the tall dead grass and brush moving and kept a sharp watch. As the movement in the grass grew nearer, I could see no height to the animal until it was very close. Then, a small stray tomcat halted in his tracks undecided which direction to take because yours truly was in his path of flight. I immediately sent him scurrying toward the first party and shouted, "He's coming your way!" Again, eyesight centered on the moving grass with tenseness mounting as I watched. All at once tenseness relaxed and a foolish look came over the face of the other man. Thus ended the hunt.

A few days later a mangy bobcat was killed in the vicinity which no doubt was the animal seen to enter the area and had travelled on before the arrival of the nimrods.

Reuben Graves, Petersburg

• One of the truest panther stories to come our way.—Editor

Shall we dance?

Dear Sir: It is understood that your Department may introduce the Cards System in all New York State.

The Cards System has been tried and proven to be practical and very useful for teaching the Art of Public Dancing, here and abroad. With the aid of the Cards System, any teacher can teach one pupil or one hundred pupils at the same time, either male or female, or both. The Cards System consists of (90) dance step figures, (2) figures on each card, (16) Povitch's Notations, on one side of a card, (45) cards for (5) dances. Each dance step figure has a name, like Rock or Roll, etc. Each card is inserted in cellophane cover and can be easily removed or placed back in a ring binder portfolio. One portfolio will serve one pupil at a time.

How the Cards System Works: (1) A teacher takes out one or more cards from a portfolio. (2) The teacher distributes the cards between the pupils. (3) Each pupil reads Povitch's notations of a dance step figure, then memorize, exercise and practice the same, in musical rhythms, either of Rumba or Mambo or Cotillion or Tango or Waltz. The process of recording the dance step figures on Cards System is copyrighted and reg. U. S. Pat. Off.

For, and in consideration of $5,000 and $5,000 payable semi-annually, your Department can have exclusive right to use and license the Cards System in all New York State. At your Department request, I will mail a copy of reproduction rights agreement, signed by me.

Stanislaw Povitch, New York City

Hybrids

Dear Sirs: I write the column "Outdoor Chatter" for *The Niagara Falls Gazette* and would greatly appreciate it if you would give me some information.

Being located on the border of Canada, our papers contain a large amount of Canadian news. In this news there has been a great deal of publicity concerning Ontario's "new" splake (or Wendigo) trout. However, in a recent copy of *Sports Afield* magazine I read a very interesting article stating that Seth Green made the same cross in 1885 at our own Caledonia Hatchery, but that nothing much came of it although some of the hybrids were stocked. Is this information correct?

This same article went on to say that New York is now experimenting with a sam brown trout (a cross between a salmon and a brown trout) and a sambo (a cross between a salmon and a rainbow trout). Is this information correct also?

William Hilts, Niagara Falls

• The first published reference on trout hybrids by the Commissioners of Fisheries of the State of New York seems to have been in 1880 covering the years 1878 and 1879. This report states female salmon trout were crossed with male brook trout (the name salmon trout was in those days used for lake trout). Subsequent reports give further details including also the stocking of such hybrids, also back-crosses (this being a fertile hybrid).

The name "splake" was not used at that time but the hybrid between female lake trout and male brook trout is now commonly known as "splake" and has some attractive fish cultural and sports fishing possibilities. At present a program of trying splake in certain Adirondack ponds is in progress (see THE CONSERVATIONIST, *April-May, 1957).*

In recent years considerable research has been done on hybrids notably by the Swedish State Institute of Fresh Water Fishery Research (Drottningholm, Sweden) and Pennsylvania Fish Commission (Bellefonte, Pa.). In the course of research on the salmon project in New York we have experimented with several hybrids including the "sambo" (cross between landlocked salmon and rainbow) and "sam brown" (cross between landlocked salmon and brown trout).

Efforts with these two hybrids so far can be classed as preliminary trials. We have no large-scale breeding research with them in progress. To date the salmon-rainbow hybrid has shown no hatch at all and it does not appear that the "sambo," as attractive as its name may be, shows much promise for the angler. The "sam brown," made by using female brown trout and male salmon has not shown good viability but the reciprocal cross, female salmon and male brown trout shows better viability.

There are many indications that crosses between closely-related strains might result in many improved strains. Just as hybrid corn and many other plant and animal hybrids have improved yields in agriculture, a program of systematic improvement of fish breeding might be expected to pay off eventually.

At present, located at the Rome Hatchery, we are operating a selective breeding project on brook and brown trout to develop disease resistant strains. If successful this would eventually decrease fish hatchery costs materially. Many crosses between strains of brook trout and brown trout are being made in this work, which is of wide interest to fish culturalists throughout the country. In setting it up, strains of trout which seemed promising were assembled from many states.

Selective breeding of trout for various other desirable features is in progress at Bellefonte, Pa. While it would be impossible to mention here all the research in progress with inter-strain or inter-species crosses on a world wide basis, I wish to emphasize that the results of such work are widely useful. It is neither necessary nor desirable for each state or agency to duplicate what is being done elsewhere. In general, however, not nearly enough of such experiments are in progress considering the many attractive prospects of improving fishing eventually through developing strains of fish adapted to special purposes.—John R. Greeley, Chief Aquatic Biologist

Crew

Dear Sir: Have just been reading December-January, 1956-57, CONSERVATIONIST and think that I can help Mr. O'Keefe identify the other two men on the tractor drawing ore from Tahawus. The man on the front of the tractor is my uncle, Leon Braley, formerly from Newcomb, and recently retired from Kodak Park Plant at Rochester. And the other, I believe, is Howard Bush, formerly of Newcomb and now on the police force at Glens Falls.

Ila M. Rodgers, North Creek

• That about completes the personnel aboard or alongside the old steam-tractor we pictured. Mr. O'Keefe had identified the man in the cab as the late Duke Austin of Long Lake.—Roland B. Miller

Credits

First cover, third cover, Clayt Seagears; second cover, pages 6, 7, 16, 17, 18, 19, 20, 23, 24, 25, 26, 27, 28, 29, 35, H. Wayne Trimm; 2, Seagears, Roy Irving; 3, 11, 13, 22, 33, Irving; 4, Dave Allen, H. G. Wilm; 5, Nick Drahos, Wilm; 8, M. D. Grosslein, D. M. Payne; 9, Ben, DeLaMater; 14, John D. Bulger; 21, Trimm, Harold Lyon; 32, Ginny and Wendy Neefus; 36, Trimm, College of Agriculture (Cornell); 37, R. S. Berg, Robt. Strosnider; 38, American Forest Products Industries; 39, Trimm, Irving; fourth cover, N. Y. S. Museum.

The Pitch on Family Camping

SOME people have the remarkable ability to pitch both camp and vacation simultaneously.

This sort of thing is going on in the upper half of the picture where things are happening pretty fast.

Other things are about to happen faster—for Sister is fumbling in her purse for the car keys. On the way to the campsite last evening, she saw several crew cuts congregated at the nearby trading post. And now she is in urgent need of a 3-cent stamp.

Unfortunately, Sister is an active member of the lodge which believes that the power of a motor vehicle and the mastery of its driver can best be demonstrated by the terrifying technique of the terrific takeoff. But this time her penchant for jet-type acceleration from a standing start will rear back and bite her. She is unaware that, partly for the sake of expediency and partly because it was a bit dark, Father and Junior affixed many of the tent's guy ropes to the vehicle and to other items of equally low-grade utilization for such purpose. So in a moment we should have a satisfactory demonstration of the simplest way to break camp.

We also suspect that the tent, the table and other gear, including Junior's nose, will undergo substantial alteration before Sister decides that all that traffic following along behind is too tenacious for self-motivation.

I confess that this picture of chaos-at-the-campsite is based on personal experience. The trick is to spread the confusion over such a period that the better beats the bitter by a hiker's mile.

Incidentally, the three girls shown tranquilly occupying the foreground were put there just to show that, *when comfortable*, camp life *can* be beautiful.

Four times more people now go tent camping than 20 years ago. Today's wholesale exodus outdoors for living indicates that the future trend to the tent will be tremendous. So, whether you've ever been camping or not, chances are that you'll go sooner than you think—family style.

It's much easier to camp comfortably than not. All it takes is the right basic equipment. Now is a good time to get the stuff together and go—even just for a long weekend.

Your Basic Need

The rather obvious requirements for comfortable camping include (1) adequate night and day shelter, (2) comfortable bed and stay-put bedding, (3) easy facility to cook food and a place to sit down and eat it—all in a satisfactory environment and during prolonged rain, wind, cold, hot sun and despite biting insects.

Every veteran camper has his own pet type of lay-out, designed for special need, length and place of stay and method of transportation. But the following guide to the kind of basic requirement will provide any novice with an entirely adequate and comfortable outfit:

SHELTER—Tent, preferably with floor cloth, large enough to house the required number of folding cots with standing and storage room between. Size 8′ x 10′ is plenty adequate for two or 10′ x 12′ for three. If more than three cots are used, it usually is much simpler to get another tent. This should duplicate the other in conformation. Thus when the two are pitched front to front, the intervening living space can be tarpaulin-covered neatly and tightly without rain-catching sags in the canvas—likely to occur if the opposing tent angles are at variance. The so-called wall tent is standard, has great space economy and can be erected in many ways. It has dozens of variations, usually called bungalow-tents, with sewed or snapped on screened front porches. They're more expensive but worth it. At least one window which, like the entrance, is screened and weather-flapped is a must.

In any event, the tent must have a projecting tarpaulin or canopy large enough to shelter a table and cooking facilities, seats and all non weather-proof food or equipment which can't *conveniently* be stored in the tent or car.

Much greater comfort is assured if the canopy can be net-screened and has movable canvas sides which can be shifted around according to view, wind, etc. Sides and screens, when not purchasable, are easy to make and attach. If plain mosquito netting is used, it can be dyed brown or green for eye appeal. The lighter the color—the greater the daylight privacy.

Never anticipate that poles or trees spaced conveniently for tent support can be found at any campsite. If the tent is equipped with the new light metal framework, so much the better—provided a mechanic isn't necessary to put it together.

So—a tent should be large enough for comfort, easy to erect, well ventilated, screened and provided with an awning to shelter outside cooking, eating, lounging, and storage.

BED—The ideal combination is a light cot of convenient design, an air mattress, sleeping bag, sack-type sheet (plus spare) to fit inside the bag (or for use outside) and a good pillow. The whole outfit can be bought for less than $30 and, other conditions favorable, it will guarantee sleep by night and soft spots by day.

COOKING AND EATING FACILITY—A camp fire may be the picturesque way to develop cooking heat but it also makes smoke, soots up the utensils, takes time and wood, requires plenty of management experience and is too tricky to operate under most canvas shelters. Instead, use a regular camp stove but make sure the mechanics of operation are thoroughly understood by *all* hands and take along whatever may be required to keep the thing cooking. These stoves are light, relatively inexpensive and can be used under canvas.

Picnic tables used at New York State's public campsites have a work surface 32″ x 70″, are 60″ x 70″ over all including the built-on seats (as in the picture) and can be moved under the tent's canopy. One end can be used for the stove and cooking utensils.

Where no tables are available, your own folding variety is easily obtained. Use extra sturdy card tables or hinged planks with folding legs or saw horses.

OTHER GEAR—Lantern, canvas water bucket, insulated box for keeping butter, milk, etc., mirror, plenty of spare rope or wire, metal coat hangers, playing cards, hatchet or axe, couple of candles, bug juice, hanging shelf or cloth wall pockets, etc.

Pitch the tent, rig the canopy, give your gear a trial run for fit, operation and convenience and show the family how it all goes together *well before* you take the stuff afield. Then all hands can set forth with confidence.

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These campsites are amazing places. Visit one before you take off on your own junket. You'll see every kind of tent known to mortal man. And you'll get ideas on how to be comfortable—and how not to. But get that mattress, that sleeping bag, that stove, that tarpaulin, plus plenty of rope—and you're in business.

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Life can be beautiful....

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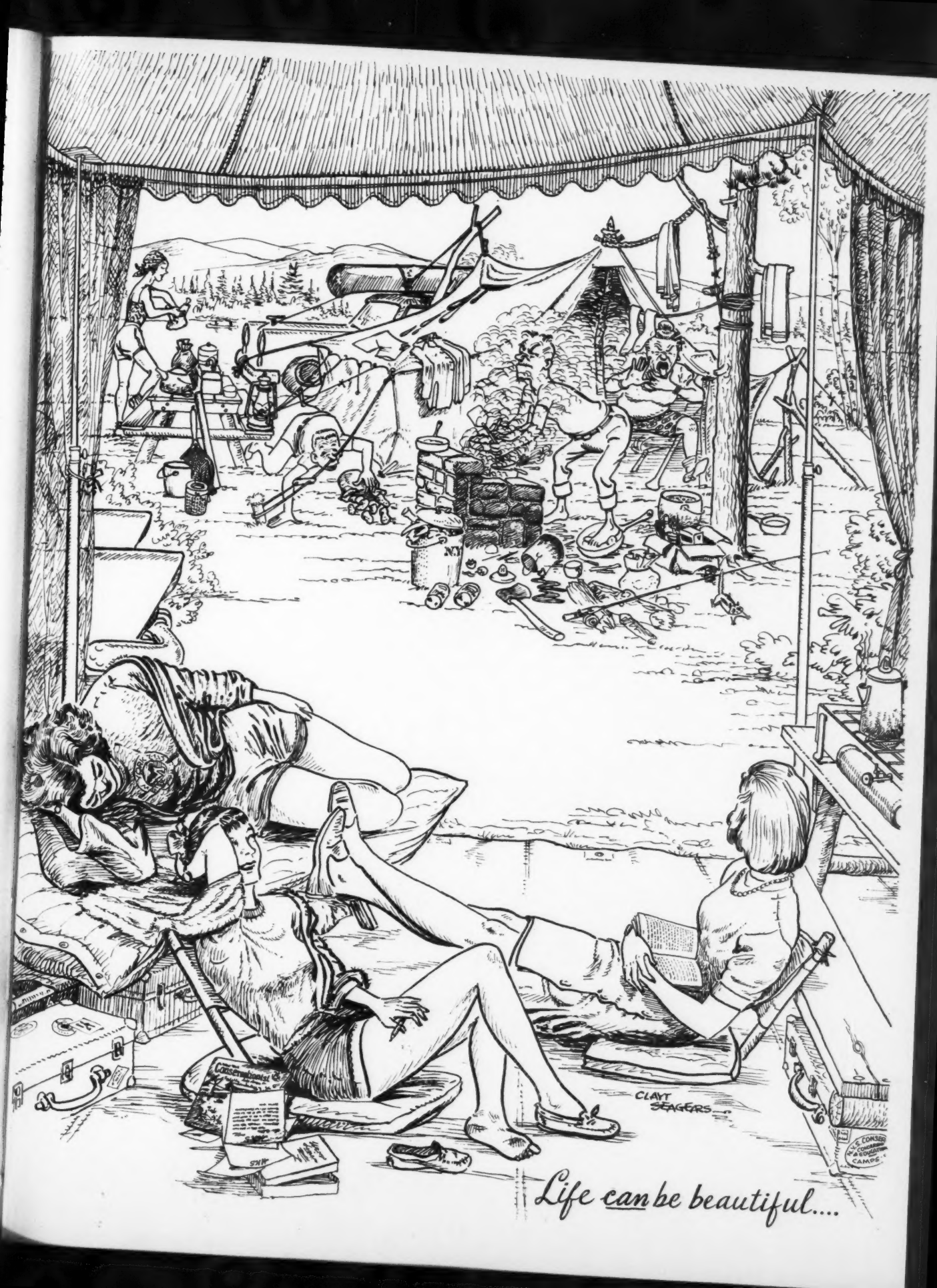

Life can be beautiful....

INDIAN PIPE; CORPSE PLANT
Monotropa uniflora

PINESAP; FALSE BEECHDROPS
Hypopitys americana

(Courtesy N. Y. S. Museum)